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Gleanings in Bee Culture

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Editorial

As usual, our index for the current year will be inserted in the Jan. 1st issue. Those whose subscriptions expire with this number can have a copy of the index by making request on a postal.

METCALFE'S METHOD OF EXTRACTING.

We would call attention to the very interesting series of moving pictures by O. B. Metcalfe, showing the method he employs for taking off his honey. This will be interesting as well as valuable to the beginner and the veteran. Right here we wish to draw attention to two statements of Mr. Metcalfe: 1, that it is not necessary to brush or dislodge *all* the bees from the combs; 2, taking all the combs off at one operation and extracting them after they are all off the hive.

THE NEW OFFICERS OF THE NATIONAL BEE-KEEPERS' ASSOCIATION.

WORD has just been received from General Manager N. E. France, of the National Bee-keepers' Association, that the officers elected for the coming year are as follows:

President, Geo. W. York, Chicago, Ill.
Vice-president, W. D. Wright, Altamont, N. Y.
Secretary, E. B. Tyrrell, Detroit, Mich.
General Manager, N. E. France, Platteville, Wis.
Directors, 1914.—J. A. Stone, Springfield, Ill.
O. L. Hershiser, Kenmore, N. Y.
H. A. Surface, Harrisburg, Pa.

We believe that all the above are strong men who will make good officers for the Association; but we feel that the bee-keepers should be especially congratulated in their choice of secretary, in Mr. E. B. Tyrrell. We happen to know that, in his work as secretary of the State Michigan Bee-keepers' Association, Mr. Tyrrell has distinguished himself in more ways than one, and we are sure that the National, headed by this list of officers, and with such a secretary, will have one of the best years it has ever known.

HONEY-COOKING RECIPES.

OCCASIONALLY some one mentions a splendid recipe for making cake, cookies, candy, etc., in which honey is used instead of cheap syrups or molasses. In the A B C and X Y Z of Bee Culture there is a good collection of honey-cooking recipes, but we are sure that there are many more in use

that are not generally known. As we are firm believers in the use of honey in cooking we wish to get together a number of new recipes that have not been published heretofore. Accordingly, to any one who will send us something new, which we can use, we will extend his subscription to GLEANINGS one year; or we will send post-paid a copy of "How to Keep Bees," by Anna B. Comstock, "The Townsend Bee-book," "Alexander's Writings on Practical Bee Culture," or "How to Keep Well and Live Long," by T. B. Terry.

Please let no one get the idea that honey may be used indiscriminately in the place of molasses or sugar, for instance. Sometimes a smaller or larger amount of honey must be used, and occasionally both honey and sugar give better results than either one alone. Some recipes specifying honey result in failure because they have not been tested sufficiently to fix the right proportion of the different ingredients. We wish only those which have been tried and proven.

Honey is already being used with gratifying results in canning and preserving fruit, making all kinds of candy, sweetening cakes and cookies, baking bread, etc., and the general public ought to know that it is far superior to molasses and glucose preparations.

OUR ANTIQUATED METHODS OF SHIPPING COMB HONEY, AGAIN.

THE more we think of the unscientific way in which comb honey has been shipped, the more we are surprised that the method has been allowed to go on thus many years. Comb honey is an exceedingly fragile commodity, especially when the weather becomes rather cold; and yet bee-keepers for the last thirty years have been shipping it in boxes or cases, without any cushion to absorb the shock or jar sustained by the delicate combs. It has been only within the last year or so that we are beginning to exercise common sense by using corrugated paper in the bottom of the cases. We ought, in fact, to use more of it, even putting in cross-partitions of it, in the same way eggs and bottles are packed. Then we should see to it that the cases are put into carriers having on their bottoms four or five inches of straw. When a single shipping-case is shipped by express, the case itself ought to be packed in straw in another box.

Who would ever think of sending eggs, glassware, or delicate chinaware in solid wooden boxes without any straw or packing? and yet that is exactly what we have been

doing in shipping comb honey, fully as fragile and much heavier. Then we turn around and blame the railroad men, and they in turn advance the rates on us. It has also come to pass that many comb honey buyers quit the business because they would not stand the loss from breakage and leakage. Now, then, will the bee-keepers of this day and age wake up and put their honey in more up-to-date cases? Why should we continue to use the old-fashioned shipping-cases with solid no-drip cleats? The supply manufacturers will make whatever comb-honey producers ask for.

R. F. HOLTERMANN RETIRES FROM OUR EDITORIAL STAFF; OUR NEW CANADIAN EDITOR.

LITTLE did we think when we prepared the editorial on page 746 of our issue for Dec. 1st, speaking of Mr. Holtermann and some of his work as a bee-keeper, that he was about to retire from *all* apicultural writing. Shortly after this, we received a letter from our correspondent, stating that he felt it his duty, during the winter months at least, to take up again the preaching of the gospel; and in order to devote to this his undivided attention he deemed it necessary to give up all writing for the various publications with which he has been connected. On this account, he asked to be released; and while we were sorry to lose an old and valued correspondent, under the circumstances we did not feel that it would be right to dissuade him from his purpose.

As we understand it, Mr. Holtermann will still retain his interest in bees, and during the summer months will work them as heretofore, for it should be understood he is very extensively engaged in the business. We believe it is his intention, during the winter, to furnish his services free of charge in neglected fields where there is no money to pay for special gospel meetings. We infer that he will use the proceeds of his apiaries in the summer time, not only to support his family, but to defray the expenses of his special work. He will enter a large field, and we wish him Godspeed. We are sure he will carry with him the best wishes of his old friends, and especially of those interested in the spread of the gospel.

In the mean time we have engaged as our Canadian correspondent, Mr. J. L. Byer, of Mt. Joy, Ontario, who is in close touch with all apicultural doings across the border. We bespeak for Mr. Byer, who will begin his work next February, the same cordial support that was accorded his predecessor. He started with nothing but pluck and determination at the bottom round of the apicultural ladder. He has been climbing up and up until now he is very near the top. To drop the figure, he is now recognized as one of the leading lights in every thing pertaining to bee culture. As a racy paragrapher, one who knows how to pick out the interesting and helpful from his large reading and experience, he has few equals.

CREDIT TO WHOM CREDIT IS DUE; THE HAND SYSTEM OF SWARM CONTROL, AND THE ALEXANDER METHOD OF CURING EUROPEAN FOUL BROOD, OLD.

AFTER we prepared the write-up of the J. E. Hand system of swarm control in this issue, page 797, we received a letter from Samuel Simmins, of Heathfield, Sussex, England, calling our attention to the fact that, away back as far as 1893, in his book, "A Modern Bee-farm," page 242, and later in the same work for 1904, page 216, he described a plan for working two colonies together that involved very much the same, if not identically the same, principle of swarm control as that described in recent issues of GLEANINGS by Mr. J. E. Hand, and in this issue. The latter's *manner* of switching the bees from one hive to another, however, is a little different, and, apparently, easier to apply.

The hive with its system of control, described in these early citations, is mentioned as a "double conqueror," and has been described in various editions of Simmins' book. We shall soon publish an article from Mr. Simmins in which he will go into details more at length; but for the present, at least, we thought it only fair to mention the matter at this time.

In this connection we may say that Mr. Simmins also draws our attention to the fact that he described in the early editions of his book, and in the little publication known as "Bee Chat," the basic principles of the Alexander system of curing foul brood years before Mr. Alexander gave it to the public. We take it that what Mr. Simmins has been describing was the European type of disease, and which was named by Cheshire as *Bacillus alvei*, and not the American type of disease; but, more anon.

A CORRECTION.

Mr. Simmins also insists that Langstroth nowhere, in any of his works, spoke of the fasting method of introducing queens, as we stated some time ago in these pages. We have made a careful search all through Langstroth's old books, and are obliged to confess that no such statement appears. Under the circumstances, it is but fair to give Mr. S. the benefit of the doubt, and we therefore stand corrected.

BEE-KEEPING FOR BEGINNERS AND "BACK-LOTTERS."

WE would call the attention of those who are just starting or thinking of starting in the bee business to the special series of articles written by Mr. F. Dundas Todd—the initial number of which appears in this issue. Mr. Todd was formerly editor of a magazine called the *Photo Beacon*, and which at that time, at least, was and is an authority on the subject of taking pictures. Ill health in his family compelled him to sever his connection with the *Beacon*, and go west. He had already begun bee-keeping before he left Chicago. While he, at

the time, was learning his A B C's in bee-keeping we were learning our A B C's in making pictures. Although we never met him personally, a very pleasant correspondence sprang up, during which we agreed to instruct him in bees if he would act as our Gamaliel in the art of photography. We read a number of his articles in the *Photo Beacon*, and were immediately struck by the simplicity and clearness of his style.

While our friend has never been an extensive bee-keeper, he has been one of a large class of professional men who take up bees for the pleasure of it as well as the profit. We call them "back-lotters" sometimes because they will run fifty or one hundred colonies in a back lot. Possibly 90 per cent of our readers belong to this class; that is to say, they have some other business or profession which they run in connection with their bees.

After Mr. Todd went west he took up his favorite pastime of bee-keeping in connection with his other professional work; and remembering his clear and simple style of writing it occurred to us he would be the man to write a series of articles for beginners and "back-lotters." We accordingly engaged him to do this work, and the first article is now before you. The fact that Mr. Todd knows the art of making himself clearly understood, and the further fact that he is an expert photographer, will mean that he will be able to furnish us some interesting matter.

A FEW TENTATIVE PROPOSITIONS ON IN-DOOR WINTERING.

FROM the correspondence that is coming in to this office, it is evident that a good many do not understand some of the basic principles governing successful wintering in winter repositories. In order to clear up the problem, perhaps it would be well to advance a few tentative propositions, and here they are:

1. Too low a temperature (below 40 Fahr. if long continued) in a bee-cellar will kill bees.

2. An excess of dampness in a cellar does no harm, necessarily, providing that the temperature is high enough, not lower than 45 or 50.

3. A low temperature, lower than 40 Fahr., and an excess of dampness, is a very bad combination, and will kill bees almost invariably. A high temperature, above 45, but little or no ventilation, will cause the bees to be uneasy. If the temperature is above 45 there should always be some ventilation. It should be continuous rather than intermittent at night, but better intermittent than no ventilation.

4. Bees can be wintered in a cellar without much ventilation, providing the temperature is held uniformly between 43 and 45, but they will winter much better if there is some fresh air.

5. A cellar may be too dry, for bees in a cellar require a little moisture. If there is no moisture, possibly a wet sponge should

be put in front of the entrances of some colonies.

6. Ideal conditions are, a nearly uniform temperature of 45 Fahr., a slight amount of moisture, *continuous* ventilation, and absolute darkness.

7. A very bad combination is a constantly varying temperature that goes down nearly to the freezing-point and then rises sometimes to 50 and 60 degrees. Such a variation is almost sure to cause disastrous losses before spring.

8. A high temperature, between 60 and 70, requires a great deal more ventilation than a temperature of 45. The higher the thermometer the more fresh air there should be. Too much can not be given when the thermometer shows 65 degrees.

9. The statement has gone out that bees do not need ventilation in a bee cellar. Fair results are sometimes secured when the mercury can be maintained at 45 degrees, within two or three degrees; but far better results are obtained when there are continuous infusions of fresh air, air having been warmed somewhat by going under ground, and the foul air passing out through the top of the cellar.

10. Occasional disturbance from the bee-keeper entering the cellar does no harm.

11. Where the conditions in a cellar are such that there will be anywhere from three to four or even six inches of dead bees on the cellar bottom in the spring we should say that the owner of that cellar ought to investigate and ascertain the trouble. No matter if he does bring his colonies through alive, it could hardly be said that he was wintering his bees successfully. An ideal cellar is one that will bring the colonies through the winter in practically the same strength as when they went into winter quarters. We have seen a good many cellars where all the dead bees that would fly out on to the cellar bottom would not make a coalhodful to the hundred colonies in the spring. We have wintered bees at Medina time and time again in one of our cellars so successfully that one could walk across from one end of the cellar floor to the other in the spring and scarcely step on a single dead bee. Do not let any bee-keeper get it into his head that these old bees are superannuated and would die anyway. In any cellar where the conditions are such that there will be two or three inches of dead bees on the cellar bottom in the spring, there is something wrong.

12. Honey-dew, or very dark or an unpalatable or poorly ripened honey may cause dysentery before spring, even when all the other conditions are ideal.

13. Pollen in the combs does little or no harm. The old theory that pollen was the cause of much of our winter losses is now an exploded myth.

14. The size of entrances will depend upon the character of the cellar.

15. Shutting bees in the hives with wire cloth is usually attended with uneasiness; and, unless removed, there will be severe mortality.

Stray Straws

By DR. C. C. MILLER, Marengo, Ill.

R. F. HOLTERMANN, that's a bright kink of yours when carrying a hive like that on p. 757, but there's a still better way, without standing frames on end, *if* you have end-cleats. See picture in "Forty Years among the Bees," p. 33. You will see that the strain is taken off the fingers, the weight resting mostly on the arms.

LET ME SAY to the Judge, page 725, that, although enlarged worker-cells failed in Medina, because too large, in Europe they claim to rear larger workers in cells enlarged only a little. If your foundation hangs within $\frac{1}{8}$ inch of the bottom-bar, I guarantee your bees, if they are like mine, will increase that $\frac{1}{8}$ to $\frac{3}{8}$. Most bee-keepers think the upper wire in a brood-frame very important, and I suspect that, although your frames are nicely filled without it, you will find that the upper cells are stretched enough so they will be used only for honey, not brood. Your rabbits look good. [Granted that you can produce larger bees in larger cells, have you gained any thing? Cheshire has made the statement that, if we could successfully enlarge our bees, we would put them out of harmony with all the blossoms visited.—ED.]


REV. J. G. DIGGES, experimenting in 1907, found that when working on white clover a bee's load rarely exceeds $\frac{3}{10}$ of a grain of nectar, yielding from $\frac{4}{10}$ to $\frac{9}{10}$ of a grain of ripened honey—an average of $\frac{3}{10}$ of a grain. That means 37,333 loads for a pound of honey; and a colony storing 5 pounds would bring 186,666 loads. Now some one tell us how many fielders in a colony, and we can tell how many trips each bee would make in a day. If 20,000 fielders, each bee would make about 9 trips. [From data prepared by Prof. Koons, of the Storrs Agricultural College, Connecticut, we figured that, while 10,000 bees might carry a pound of nectar, it would probably take 20,000 on an average. A good deal will depend on the source of the nectar, the kind of climate, and perhaps on the kind of bees. Prof. Koons' figures were practically verified by Prof. Gillette, of the Colorado Agricultural Experiment Station, and Prof. Lazenby, of the Ohio Experiment Station. Their calculations were arrived at by means of delicate balances used in chemical laboratories, and we would naturally infer that they are not far from right.—ED.]

ENTRANCES 16 inches apart will not work, page 764. No; but they may do better 32 inches apart. And you can have hives 16 inches from center to center and entrances practically 32 inches apart by having the entrances in pairs. I know, for I've tried it. [Your statement, then, is exactly in

harmony with our answer on page 764. Colonies can be worked in pairs with entrances 16 inches apart, or from center to center; but when we put more than two side by side, as Mr. Phillips outlined, we encounter difficulties—at least that has been our experience. One great reason why house-apiaries have not given a greater degree of satisfaction is because of this very fact, that the strong colonies become too strong at the expense of the weaker ones.—ED.]

WESLEY FOSTER, page 750, advises 6×8 "Fragile" labels on honey-packages. Good, but too troublesome to get. Why doesn't the Root Co. list them in supplies? [For years the publishers of this journal have listed and sold caution cards or labels such as you describe. For example, the design below is furnished in heavy manila card-

FRAGILE! COMB HONEY

Handle with extra care.
Do not move it on hand trucks. 
Do not drop it. Load with finger point-
Do not dump it. ing toward bow, en-
Set it down easy. gine, or horse.
Haul only on vehicles with springs.

board, 5×7 inches, printed in red ink, for a cent apiece, or \$2.00 for 500. You will find them listed in the regular honey-label catalog.—ED.]

I'M PRETTY badly chewed up on page 748, but still have enough life left to fight back a little. Even though it should be that "man will never produce a non-swarming race," you fellows shouldn't throw cold water on any one who aims in that direction. You fell down on the red-clover-queen proposition, but did you lie there whimpering in the dust? Not a bit of it; but you jump up and say, "We are in hopes some day of running across another 'sport.'" There is a difference in tongue-length, and if the thing is thought worth following up some day there may be the fixing of a strain with long tongues. Same with swarming. There is a marked difference in the tendency to swarm under the same conditions. Do you dare to say that careful selection may not increase the tendency toward non-swarming? Increase it far enough, and fix it, and there you are. "Tendency to revert?" So there is in all improvement in breeding; but that doesn't stop the improvement. [We did not say that something could not be done toward securing a strain of bees that would be *less inclined* to swarm than the average stock; but we did take issue with you on the point that man could ever "produce a non-swarming race of bees." We admit that the swarming tendency, or any other undesirable tendency, can be mitigated; but unless the apiarist is "on to his job," and at it all the time, there is a strong tendency to revert to the original type. This is experienced in poultry and in all kinds of farm stock.—ED.]

Siftings

By J. E. CRANE, Middlebury, Vt.

Our congratulations are due Wesley Foster, of Boulder, Col., page 609, Oct. 1.

My experience tallies with that of Dr. Miller and his assistant in regard to the preference bees have for an old comb over a new one, page 646, Oct. 15.

Bee-keeping in Southern California, by Mrs. Acklin, is certainly refreshing. One of the pleasures of reading bee-journals is to see how different conditions are in different sections of our great country.

We are grateful to Dr. Miller for informing us that honey-comb in the Bible always means comb honey, page 612, Oct. 1. Now will he tell us if the "droppings of the honey-comb" means extracted honey?

On page 612, Dr. Miller says he doesn't want the bottom of his sections mussed up with wax and honey. Well, we use thin strips of wood under our sections, and we do not have *any* propolis on them.

Pollen in a queen-cell is a sign of queenlessness, says Dr. Miller, page 646, Oct. 15. But I have never seen pollen, that I remember, in a normal queen-cell; but I see every year a good many queen-cells started over cells of pollen. This is a sure sign of queenlessness.

It almost takes my breath away to read how quick Mr. Scholl can get the bees out of supers with smoke, page 647, Oct. 15. This works pretty well here till the flow of honey is over; then the bees left in the super, when removed from the hive, stop and fill themselves with honey, breaking the cappings and making the sections *unsightly*. It may not matter with chunk honey.

The editor speaks of "bees making trouble in candy-factories," page 644. I would put it in a different way. How would it sound to say, "candy-factories making trouble for bee-keepers"? Would not a law compelling candy-manufacturers and those selling sweets in the open near where bees are kept, and other places attractive to bees, and where thousands are killed, to screen their windows or their sweets, be as sensible as the law against spraying fruit-trees when in bloom?

Quite right you are, Mr. Editor, in advising late feeding if not done before, though you have to use overcoat and mittens; this is a decided advance, for not long ago we thought it would be almost fatal to feed

late. One caution, however—be sure to feed with pepper-box style of feeder, and place it over the center of the cluster, and, as you say, feed hot.

I congratulate Dr. Miller that his bees swarm at the proper time, just as the books say they should, page 578. That he never heard before of a swarm waiting till a virgin is about to emerge surprises me. We have lots of them that do that very thing, especially early in the season. It is fun, too, to get a lot of queen-cages after such swarms and cage a lot of virgins as they emerge after the old queen has left. We are dead sure they are all raised under the swarming impulse.

Whew! a flying-machine! page 628, Oct. 1. Well, this reminds me when I see this and other illustrations what a change there has been in our journals in the last thirty or thirty-five years. Then we were trying to walk, while now we are discussing how to manage outyards with automobiles, and market immense quantities of honey. Then we had only a few plain woodcuts, while now we have a generous array of beautiful photogravures with pictures of a large share of the successful bee-keepers of the country.

I was glad to see, page 724, Nov. 15, that "the Judge" has not lost his interest in bees. While at our State capitol a few days ago he invited us to stay over night at his pleasant home in Barre. While there he very politely informed me that my statement in Siftings, that we have a law in this State prohibiting spraying while fruit-trees are in bloom, was incorrect, as the law has been repealed. He has my thanks, and I hasten to make the correction. However, the law was in force long enough to educate our fruit-growers as to the folly of spraying while trees are in bloom.

On page 627, Oct. 1, we see a whole row of hives covered with tarred paper lined with dry leaves and other non-conducting material; and it seems to me that plan might work very satisfactorily. Some three years ago I tried four hives with tarred paper. All were single-board hives, and two had cushions on top, and came out fairly well in the spring. The other two came through the winter quite too weak to be of any service in storing surplus during the summer. By putting between the paper and brood-chamber a considerable amount of packing, it would not only protect the brood-chamber from excessive heat during sunny days in winter, but absorb a large amount of heat that would keep the bees warm for some time after the sun failed to shine. We do not want to heat the brood-chamber during winter so hot as to excite the bees to excessive activity, as it weakens their vitality and wears them out before spring.

Bee-keeping in the Southwest

By LOUIS SCHOLL, New Braunfels, Texas

THE DISTANCE BETWEEN APIARIES.

There is a great difference of opinion as to how far apiaries should be placed from each other, as well as to how many colonies should be kept in a location. This, of course, depends very much upon the character of the respective localities and the honey-flows. However, on the whole there is quite a difference of opinion among bee-keepers, even if the same kind of location is taken into consideration.

We have found to our entire satisfaction that it is better to place fewer colonies in a place, and scatter the bees in a larger number of apiaries. It is true that, during good years, the bees in certain locations may not gather all the nectar; but there is an advantage in having some nectar for the bees that are there during a poor season. For this reason we prefer to have our apiaries about three miles apart, except in cases where the locality is broken up or irregular, so that the apiaries must be located wherever a suitable spot is found.

After trying various numbers of colonies in a place and various distances between places, we have arrived at the conclusion that the above distance, with 50 colonies in each apiary, is the most satisfactory arrangement. We should prefer this, even if 100 colonies can be kept successfully in an apiary. Besides distributing the bees over the territory which can be gleaned more profitably, and to better advantage, we have found it a great advantage to work smaller apiaries of 50 colonies each over larger ones. This is especially true with our method of management, by which we are able to finish just so much work with one visit as is required by that number in a place. During times when bees are inclined to rob, which here in our localities is almost at all times when honey is not pouring in, we can finish up the "job" at one of these yards and work at another three miles away before the bees make trouble. If it becomes necessary to work several days with 100 colonies the trouble is often serious before the work can be finished in an apiary of 100 colonies all in one yard.

We claim that our bees can gather to advantage if they are not required to fly a great distance. Some authorities differ with us; and right in line with this is a letter from L. B. Smith, of Rescue, Texas:

We often see the question asked, "How far apart should apiaries be established for the best results in storing honey?" The answers range from one to five miles apart. If I were to answer that question I would say from five to eight miles apart. Suppose some of you who believe bees never go over one mile and a half for stores try putting all the bees you have scattered around a mile or two apart into one apiary, and see how much decrease you would

have in the amount of stores. I'll warrant some of you will have less faith in this mile-and-a-half flight of bees.

A thing that we have tried in a reverse way! Having nearly a hundred colonies in a place showed that the average yield per colony was not so great as other yards of a lesser number in the same kind of location. Moving away half the number to a new place nearly three miles away *proved* to us *conclusively* that it was an advantage—all the apiaries in the same kind of locations averaged nearly alike. See?



MORE NORTHERN "CHUNK" HONEY.

Aha! More and more the bulk-comb-honey idea is gaining ground in other parts of the country than the great Lone Star State, "the home of bulk comb honey." The editor, in the Nov. 1st issue, says, "Those who do a business of putting up honey in tumblers or large-mouthed bottles will find it will pay them well to take all their broken and unsalable comb honey, cut it up into suitable-sized chunks, and put them in tumblers of nice extracted honey. There was a time when the public was a little suspicious of honey in this form; but since the national pure-food laws have gone into effect the bottler will find ready sale for chunk honey in tumblers."

Yes, Mr. Editor, that's the idea all right; and we wouldn't stop there. Put up more of comb honey, produced so much easier in *good* shallow frames instead of section boxes, into nice bright tin friction-top pails and cans of the 3-lb., 6-lb., and 12-lb. sizes, that we have long ago adopted here in Texas, and you will find ready sale for these also in a short time if not now. It will enable you to introduce honey into the homes of a great mass of people who would buy comb honey—real nice comb honey—at a price which they can afford, and people who do not care to buy extracted honey in any kind of package.

Bulk comb honey will help the markets in more ways than one. More honey will be consumed if bulk comb honey can be had by those who do not care for extracted honey, and those who can not afford the price of section honey. It will aid in a better distribution of honey, keeping a large quantity away from the general markets, which *must* aid in keeping up the prices.

We have taken the liberty of repeating your entire editorial, because it covers two very valuable points favoring the production and sale of bulk comb honey—first, that the suspicions of adulteration of such a product are fast giving way on account of the pure-food laws; and, second, because it shows that a ready sale may be found for such honey. Another reason for copying it is that some of my correspondents who have asked me for just such information through this department may not have noticed the editorial in the former issue.

Conversations with Doolittle

At Borodino

ARRANGING AN APIARY SYMMETRICALLY.

"I have 107 colonies of bees, all nicely housed in the cellar; but next spring I am to move to a new location. Where I now live I have been in the habit of having my hives arranged 'any old way,' and I am tired of such work. When I get to my new place will it be advisable to arrange the hives in the apiary symmetrically, with reference to each other, and is there any harm likely to result from such arrangement?"

"For your convenience I think such arrangement decidedly advisable, and, if rightly done, I think no harm can result.

"There are two objections when hives are set too close, the first of which is quite serious—the loss of young queens. Where an apary is laid out on the hexagonal plan, as is considered the best by our most practical apiarists there is quite a sameness about the rows, and the hives in the rows, throughout the whole apiary; and if the hives are too close together, the young queens, when they go forth to meet the drone, seem to fail in marking the hive she came from, so that often on her return she enters the wrong hive, in which case she is killed. This results in the loss of the colony from which she came, unless the bee-keeper notices it and supplies the bees with another queen.

"After trying different distances I now use a ten-foot plan—that is, the rows of hives are ten feet apart, and the hives stand ten feet apart in the rows, from center to center."

"I suppose I can have all the room I need; but what would the result be if I use half that space, or five feet from center to center?"

"Unless you take some other precaution I should fear a loss; and, besides, with hives that near together you would be discommoded in your work. Each of your hives will take up nearly two feet of room, so you would have only about three feet left when going straight along the rows; and when it comes to traveling obliquely, as you will want to do more often than otherwise, you will have still less. Then if you use a wheelbarrow, cart, or something of that kind to convey hives, supers, honey, etc., about the apiary, you will be coming in contact with the hives so often that you will wish you had kept on in the old way. But with the ten-foot plan you will be pleased with all the different streets and avenues that the hexagonal plan will give all through the whole yard."

"I suppose the hives could be painted different colors, thus helping the queens in knowing their own hives?"

"Painting helps somewhat; but trees of different kinds and sizes are of much greater benefit. With half a dozen trees scattered about in an apiary of 200 colonies there is little trouble, and they are very restful,

on account of shade, to the hot and tired bee-keeper when the mercury is hovering from 90 to 100 degrees."

"What was the other item besides the young queens failing in their markings?"

"If you practice clipping the queens' wings, as nearly all bee-keepers do, a returning swarm sometimes attempts to enter adjoining hives. This can be remedied by covering them with sheets, where natural swarming is allowed. But the day of natural swarming is nearly or quite a thing of the past with the specialist; and where such is not allowed, of course this part cuts no figure in the matter."

"I suppose the young bees mix some on their first flight, in closely laid-out apiaries?"

"Yes, to a certain extent; but with me this has been of little account, and especially as I have always had a few trees on the outskirts of the apiary."

"Tell me how I may best lay out my ground for 200 hives."

"This I have told several times in the different bee-papers."

"This may be so; but I am a beginner in trying to keep a tidy apiary, and beginners are coming on all the while. Such do not want to wade through old musty volumes to find out what was told long years ago."

"Procure a string about 210 feet long, and tie each end to a strong nicely sharpened stake. Next stretch it just where you wish your first row of 20 hives to be. If this string is of common binder twine, it will be better than any thing else you can get, as it stretches but little. Having placed your line, measure off five feet from one end of it, and at that place tie a red string to the twine. Now measure off five feet from this string, out along the line, and tie a white string. Five feet further tie another red string, and five feet from this another white, and so on until you reach the fortieth string tied on. Now stick a little stake at each of the twenty red strings, for here are to set your twenty colonies on the first row. Now move your line ahead ten feet and stick a stake at each of the white strings, where you will set the next twenty hives. Move ahead ten feet again, sticking the stakes at the red, then ahead ten feet again, sticking stakes at the white, and so on till you have your twentieth row completed. You will now level down a nice place at each little stake, and, if you can afford it, make a permanent plot, three by four feet, at each stake, of concrete, on which to set each hive. In this way you will have no trouble about weeds and grass springing up all about your hive, so close up that it will be a nuisance to the bees, and to yourself when mowing the yard two or three times a year. It is well to have the hives face the south, and, if so, the four feet should be north and south, so that this concrete block will go out the furthest in front of the entrance, as this helps the bees very much in their flights where the apiarist does not mow the grass at exactly the time needed."

General Correspondence

PROGRESSIVE ADVERTISING.

A Few Points that Every Bee-keeper who has Honey to Dispose of Should Carefully Consider.

BY E. G. HAND.

Has it ever occurred to you, gentle reader, how strange it is that the average bee-keeper seems to have an idea that he has practically no control over the demand for honey in his locality, even as the fraternity at large has apparently given up what little glimmer of hope it ever had of exercising a control over the general demand for its stock in trade? Whatever may be the explanation, the bee-keepers of the country seem to have resigned themselves to unprotected acceptance of whatever demand the fickle public may choose to make upon their product. When a good crop is secured, either locally or generally, the first result is usually quite a panic on the part of the producers to get it off their hands as quickly as possible. For fear the other fellow will get his crop on the market first, the price is pruned to the necessary extent to induce the commission man to take the crop. The commission man chops his price to the wholesaler, the wholesaler to the retailer, and the retailer to the consumer. This, of course, stimulates the demand to a certain extent, though to a limited one only. But wherein does the bee-keeper profit by his big crop under these conditions? He has had more labor with his heavy crop than he would have had with a lighter one, and is no better off.

With this scrambly method of marketing pursued, what surprises me is not that the price of honey is so low, but that the large amount produced each year is disposed of at all. The average producer, especially the large producer, does practically nothing to help place his product in the hands of the consumer. He seems to have the impression that, when the crop is out of his hands, that is as far as he is concerned in it, and that what becomes of it afterward does not make any particular immediate difference to him. "Let the commission man and the retailer find their own market; they took the job and it's up to them," appears to be about the stand he takes.

Now, this is all wrong, and the sooner the bee-keeping fraternity learns that there is easier money in the proper and scientific disposal of a crop, right up to the time it enters the hands of the consumer, than there is in the production of the crop—well, the better it will be for the fraternity.

Honey is but a vague word to the great majority of the population. Millions of people never taste it from one year's end to another, and most of them have forgotten

its very existence, almost. This is not because these people do not like it, but because it has never occurred to them to regard honey as an article of food; and the reason such a thought has never occurred to them is, nine times out of ten, because nothing has ever happened to suggest such a thought.

It has been my experience, and I believe if a "census" were taken it would be found to be the case the country over, that 75 per cent of the honey produced is used by 25 per cent of the people. Why is this? Principally because the 25 per cent have, more or less by chance, discovered that honey is intended to be eaten, and is good to eat every day, and have accordingly formed the "honey habit." The other 75 per cent are almost complete strangers to the very name of honey; and, unless they happen to have it personally and directly brought to their notice by a "honey peddler," or chance to fall over it in their blunderings through the underworld of the grocery store, the probabilities are that they will never come to be users of any great amount of honey. People get into ruts in the matter of the food they eat, just as they do in the matter of the clothes they wear or the thoughts they think.

It isn't because he is stupid that the average man fails to take advantage of the good things of life. It is usually because he is asleep. All he needs is to be awakened up, and the present-day advertising campaign is planned with just this idea. No matter what it is that is being advertised, the principle is the same.

Now, let us see how this principle can be applied to the honey-selling proposition. Let us see by what means the producer of honey can induce the somnolent 75 per cent of the population to awaken to the fact that it is to their advantage to use honey as a regular article of diet. I am speaking now more particularly to the individual producer who is bent on stimulating his local market; and if he will work somewhat along the lines I suggest I think he will be surprised at the ultimate result. I say "ultimate," because it must be understood right on the start that advertising does not jerk, but *pulls*. The man who expects to get big results from two or three advertisements is in for a disappointment. The proper plan is to decide how much it will be wise to invest in advertising, taking into account the size of your market and the amount of honey you want to sell in it, and then arrange to spread that expenditure over the whole year, or at least as long as you have any honey to sell.

In these days of cheap newspapers the easiest, quickest, cheapest and most effectual way to get an audience with the public and arouse interest in any legitimate article is through the columns of the papers. There is scarcely a house in the land at the present time into which a newspaper of some kind does not find its way with more or less regularity. As the purpose for which the paper is

taken into the house is that the people who live there shall know the news of the neighborhood and of the world at large, it naturally follows that whatever of news the paper contains will be read and remembered for a time at least.

What is news? We will define it as something the reader has not heard of or thought of before, or additional information on some subject upon which he has cause to be more or less interested. While he is reading, his mind is in its most receptive mood, and, of all times, this is the most favorable to get his attention. We will, therefore, set out to get him interested in the honey question. Of course, it is to be presupposed that he has heard of the existence of honey, and knows something of its qualities. He may have even tasted it once or twice when he was a boy. We will begin by drawing his attention to honey in general, and to our own honey in particular, by having inserted in a prominent place in the paper a little item somewhat after this fashion:

HONEY.

Have you bought any honey yet this fall? If not, you are not getting the best you can afford of the good things that are going, for honey is universally acknowledged to be one of the most delicious articles of food, and the price of it rules lower than that of most good things.

Honey from my apiary has been produced and put up in the most approved and careful manner. Its strong point is *quality*.

Your name and address will, of course, follow the above, in type about one size lighter than the headline, and the whole can occupy any space up to three inches in the column, but preferably not less than two or two and a half, unless it be in a paper in which the advertising rates are high.

This item will suggest honey to the reader, will draw his attention to its qualities, and to you as a producer of honey, which is enough for a start. It may not arouse him to a point where he will go out and buy some of your honey, but it should not be expected to. You can't drive a nail with one blow of a hammer, you know. Next week we will give him an item like this:

HONEY IS CHEAP.

The impression prevails that honey is expensive; but it is a wrong impression, dating from the time when practically nothing was known about the management of that most industrious of creatures, the honey-bee. Modern invention has made it possible to produce honey at a price within the reach of all—ten cents a pound—and the quality is better than was possible by the old methods.

That's news, all right. He always thought honey was an expensive luxury, beyond the means of any except rich folks—that is, if he ever thought of it at all, which is very doubtful. Besides, that is the second thing he has read about honey lately. There may be something more next week. Yes, here it is:

COMPARE PRICES.

Compare the price of some of the every-day articles of food—fruit, butter, meat, etc.—with the price of honey. Consider the fact that honey is one of the very best of nature's food products. Then ask yourself why it is not more largely used—why you yourself don't use more of it—when you can buy it, guaranteed absolutely pure, for ten cents a pound.

This will set Mr. Reader on a new line of thinking. And so on. In a very short time we have the average reader's attention. In a little more time we have his interest; and before long, provided we always have a *new*, fresh, easy story for him with each issue of his paper, we have what we started out to get—his custom. He may buy at the grocery store, if your honey is on sale there, so that you do not see him come direct, but you get the benefit all the same.

The prices quoted in these advertisements are, of course, to be the same as you are asking for your honey in whatever form your advertisement may speak of it, whether it be comb honey, or extracted in glass or tin containers. The great point in advertising is to keep the advertisement always new and interesting, and, of course, always in accordance with facts. Incorrect or deceptive statements or inferences in advertising are fatal to the advertiser's business, to say nothing of the other points against them.

Here are a few more sample advertisements from a series I used in a successful campaign. They can be changed around, enlarged upon, or altered in any way to suit conditions anywhere, and are just given here to serve as samples:

DON'T TRY

the experiment of eating a lot of honey "straight" to see if you like it—it is not a fair test. Honey is a concentrated food, and should be eaten in conjunction with something that gives bulk—bread, for instance. Properly used, there is nothing that can compare with it.

And it is cheap—ten cents a pound.

YOUR GROCER

sells butter at about twenty cents a pound, and doesn't guarantee the quality. You buy it because you don't think there is any thing that will take its place.

He also sells honey at ten cents a pound. It makes a good substitute for butter. If the honey came from my apiary I will stand for the quality.

FOR A CHANGE.

Did you ever know a youngster that didn't get tired of bread and butter, and want a change?

And wouldn't he consider himself "in clover" if he got bread and honey half the time instead of bread and butter?

Honey costs only 10 cents a pound, while butter costs about twice that much.

NOTHING LIKE IT.

Honey—the pure nectar of flowers—stands in a class by itself as an article of food. There is nothing to which it can be compared.

When you want something to help out your fruit supply, get a can of honey and you have the best thing there is.

If the honey comes from my apiary, it has been produced and put up under conditions which make it the equal of any honey you can buy.

IT IS BETTER.

An article made or produced by a specialist is better than the average, because the producer makes a special study of the production of that particular article, and has facilities for putting it on the market in the best possible way.

For that reason honey from my apiary is better than the average. I make a specialty of its production, and have facilities which make it possible for me to put it out in the best condition.

ALWAYS IN SEASON.

Some people have a notion that honey is just a cold-weather article of food, and to be used only in the winter, or else they think it will spoil quickly in warm weather.

Other people know better, and use it right along.

Honey is always seasonable, and, if properly kept, never deteriorates in quality. Get in with the crowd who use it every day.

YOU PAY

about 20 cents a pound for butter if you want that which you know is good, and use it right along every day because you like it.

You probably like honey too, but have an idea it is too expensive to use every day. You can buy the best honey on the market for 10 cents a pound. That's not very expensive, is it? Get a can.

REDUCE EXPENSES

never so little, and you will soon find your "cash balance" increasing. One of the most expensive articles of food that everybody uses every day is butter. Good butter costs 20 cents a pound. You won't want much butter if you eat honey with your bread. Good honey costs 10 cents a pound—just half the price of butter.

There are many other phases of the honey question that can be dealt with in this same way: for instance, the proper care of honey; the difference between good and inferior grades; and why the difference exists; honey from different flowers; how nectar is gathered, stored, and ripened in the hives; how it is extracted, etc., interspersed with little items of natural history of the bee, and such subjects. It is an easy matter to get out one advertisement a week for a year, or almost indefinitely, for that matter, once the idea is grasped, and the interest they will arouse in your business, and the extent to which they will increase the demand for your honey will keep on growing so long as the advertisements are run, provided your honey is of the quality it should be before you should think of advertising it. And you can command a price for your honey from one to three cents a pound above that obtained by any tramp honey which may be on your local market at the same time. Your educational campaign will, to a certain extent, stimulate the demand for this latter grade too, which, however, is no detriment to you, but rather the reverse. The main object is to get the public started using honey. They will then soon learn to demand the best.

Cobalt, Ontario.

DO THE BEES' LARVÆ CAP THEIR OWN CELLS?

BY R. M'CULLOUGH.

I should like to take issue with the seemingly undisputed statement that the bees cap their brood, by stating that I think the larvæ do the capping themselves; that is, that the capping is a part of the cocoon itself. I say "I think," for I have never seen the larva in the act, although I have endeavored for two years to do so, and, for that matter, I have not seen the bees in the act of building the cappings, except in one instance—that of building the wax tip on a queen-cell, which was already capped with that fibrous material peculiar to cell-capping before the waxwork began. My theory is, therefore, based on circumstantial evidence, if I may use the term, and will try to prove my point by the following:

1. It is unreasonable to presume that the bee larva would depart from the ordinary procedure of insect larva in spinning a cocoon open at one end, to be completed from without.

2. The texture of the capping is the same as that of the cocoon in the sides and bottom of the cell. I doubt if the mature bee can produce this material.

3. The capping is an integral part of the cocoon. I have proved this by being able to remove the entire cocoon from a cell by grasping the ragged edge of the capping of a cell from which a young bee had just emerged, and pulling it out.

4. I read in the A B C book that "Bees, like other folks, sometimes make mistakes; for they do not seem to know any better than to use a drone larva for rearing a queen if such happens to be present."

This indicates to me that bees do not know the sex of their larvæ. If this is true, why do they treat a drone larva in a queen-cell as a queen larva, but treat a drone larva in a worker-cell as a drone larva by building the raised cap over it? My answer is, that the larva does the capping itself, and with a cap peculiar to its kind.

That the queen larva caps itself, I am pretty certain, the bees building on the wax tip afterward. Why should the worker and drone larva not do the same?

I further notice in the A B C book that bees sometimes leave their young uncapped; but Dr. Miller, in a note, says, "I have observed somewhat closely for years, and I think these bees are bareheaded because worms have eaten the cappings." So this proves nothing against my theory.

While I have this idea pretty well fixed in my mind, I am open to conviction.

Pittsburg, Pa.

[We are afraid that your conclusions are not entirely correct, although partially so. Cheshire (*Bees and Bee-keeping*, Vol. I., pp. 174, 175) explains that the cappings over the brood are made of debris, including pollen grains, etc., bound together with shreds of wax (all this showing under the microscope). On the inner side of this complex capping, the cocoon threads, forming a network, catch on the prominences of the wax shreds or pollen grains. The bees, then, do the capping, but the larvæ spin the ends of the cocoons inside. Your observation in regard to the queen larva is substantially correct, and very much the same is true, apparently, in the case of worker larvæ.—ED.]

How to Keep Royal Jelly Fresh.

How long will royal jelly stay fresh or keep good in a queen-cell for the purpose of transferring to a queen-cell cup? Does it have to be kept warm, and used the same day, or can it be kept for a few days and used when it is cold?

Fruitvale, Cal.

L. R. GREEN.

[Royal jelly should be used as soon as possible after being taken from the hive, for it turns rancid very quickly. We have known of queen-breeders who kept cells of royal jelly over night by sticking the end of each cell together to keep out the air and then placing them in a warm room. We can not recommend this practice, however, as it stands to reason that the fresh food would be better.—ED.]

ELIMINATING THE SWARMING INSTINCT BY BREEDING.

The Tendency to Sit has been Bred from Certain Strains of Fowls; is Not the Swarming Impulse of Bees Akin to the Tendency to Sit in Fowls?

BY W. E. FLOWER.

Mr. R. F. Holtermann, page 715, Nov. 15, asks a question concerning cat-breeding, which I should like to answer. In my article, page 632, Oct. 1, I said, "It is a fact that *Manx* cats have no tails," but the printer made me say, "Many cats have no tails." So far as I know, *Manx* cats do not exist in a state of nature; but by careful breeding they can be depended upon to reproduce their kind. The man who follows nature, no matter whether he breeds hens or horses, must be satisfied with natural results. I cited the 31st chapter of Genesis as an instance of what could be done when the mating of the parent stock could be controlled.

Thousands of queens are reared artificially, so are thousands and tens of thousands of chickens; likewise, many thousands of colonies of bees are made every year without natural swarming. The point I wish to make is, that it would be possible by careful selection to breed out the swarming impulse just as the natural instinct to reproduce by sitting has been bred out of the Leghorn and other breeds of hens.

Darwin, in "Variation of Animals and Plants Under Domestication," says, "The progeny of the first cross always reverts to one or the other of the original ancestors." Now, I might develop a non-swarming strain of bees by the method Mr. Holtermann suggested; but a single mismated queen would upset my efforts and put me back where I started from; whereas if I could control the mating of every queen as I can the mating of every hen, progress would be sure and the goal would soon be reached.

Mr. Raleigh Thompson, page 736, Nov. 15, indirectly makes the statement that I will never produce a non-swarming race of bees. He may be right, as I am near the three-score-and-ten mark; but if I could get some of our queen-breeders to see the thing in its true light the result might be accomplished.

Ashbourne, Pa.

[We do not wish to be pessimistic; but we feel that, though different breeds of hens have been developed that have lost to a great extent the tendency to sit, the *elimination* of the swarming instinct in bees would be wellnigh impossible, because of the impracticability of controlling the male parentage. However, we believe that, under certain conditions and in certain localities, there are strains of bees which possibly by chance have developed with less of a tendency to swarm; but, on the other hand, if man steps in and tries to accentuate this non-swarming tendency, his efforts may perhaps result in a greater tendency to

swarm rather than less, because, as we stated before, he can not select the drones that he wishes to mate with his queens.

The sitting tendency among hens is the most similar illustration that we know of to the swarming instinct of bees; but since man, even when he can control the mating of fowls, has never been successful in eliminating *all* tendency to sit, it would seem like a hopeless case to get tangible results along the non-swarming line among bees. However, in this connection see what G. W. Bullamore has to say on the subject in his article which follows.—ED.]

NATURAL SELECTION AND THE HABITS OF BEES.

How Natural Selection Perpetuates such Habits as Running Upward when the Hives are Drummed; Swarming, Gathering Surplus Honey, Robbing, etc.

BY G. W. BULLAMORE.

[We seldom stop to think why it is that bees have certain habits; for, in the hurry and worry of the present day, we are more apt to look at these things as a matter of course. Mr. Bullamore, in the following excellent article, gives what seems to us a very satisfactory explanation, showing why colonies of bees which have not exhibited certain traits die off, so that those which do, by natural selection, live on to perpetuate these traits. We commend this article to the careful study of our readers.—ED.]

The efficacy of environment in modifying the habits of honey-bees has been called in question by Messrs. M. E. Pruitt, page 529, Aug. 15, and R. F. Holtermann, page 548, Sept. 1. I am a firm believer in its potency, and am stating the case from my own standpoint, hoping that it may prove of interest.

I surmise that the bees from which our present stocks have descended dwelt in the primeval forest, and were very similar in their habits to the modern *Apis dorsata*. Their migratory instincts still survive, and are occasionally manifested by a "hunger swarm." The building of comb in the open air is also a survival. And now let us enquire why bees are subdued by smoke.

At the first puffs of the smoker the bees commence to gorge themselves on the unsealed or recently capped honey. If the smoking is continued they become excited and are eventually driven from the combs into the air. If the queen is young and active, she will take flight with the bees. I look upon these actions as survivals. In the past history of the race they were advantageous.

When the world was young, and forest fires resulted from volcanic and other causes, the drifting smoke would bring about these actions. Colonies that were terrified by the smoke, and took wing with laden honey-sacs escaped the fire and started afresh. Successive fires would wipe out all stocks in which this trait did not appear, and the peculiarity would become strongly impressed

on all bees by this process of natural selection.

Another peculiarity of bees is that they run upward when the sides of the hive are drummed. I explain this by supposing that, when earthquakes were common, the bees that did not run upward when their combs commenced to tremble were involved in the general ruin when the combs collapsed. Those that ran upward lived to restart the hive with their own honey and that of the less fortunate stocks. The running habit would be transmitted. The other stocks, being dead, would transmit no habits.

It is frequently stated that the large number of drones reared in a hive is for the purpose of facilitating the chances of a queen in meeting one of them when she takes her wedding-flight. Undoubtedly this is a result of the large number; but as they are often supplied by a colony different from that from which the queen issues, I think that natural selection furnishes a far more satisfactory explanation. Every hive is the product of a drone and a queen-bee. The stock that supplies the queen must also supply twenty thousand bees as an escort. The drone with his thousand or more brothers required far less effort to produce. Natural selection, therefore, favors the drone-supplying colony, and the stock that rears the greatest number of drones has the best chance of being represented in a large number of hives the following season. Heredity would perpetuate the appearance of the drone-rearing instinct in these colonies and their descendants, and in a few generations it would be general.

Gradual change of climate or the invasion of more temperate regions by swarms of bees would result in the modification of the swarming instinct. Excessive swarming and honey surplus could not exist together, and the gradually lengthening winters would kill off all stocks that did not store in excess of their immediate wants.

With regard to the modification of the swarming instinct, Dzierzon was of the opinion that the swarming habits of the heath bee of Germany were due to the system of management. This is understood to mean that, by inciting bees to swarm, they acquire the habit and transmit it to future generations. I very much doubt if this is true, and should prefer to explain it by suggesting that, where swarming is favored, the increase is greatest of those stocks with marked swarming propensities, and that this results eventually in the swamping of the non-swarming strains. If we breed from those strains with the least tendency to swarm, this habit will undoubtedly become modified. Any attempt to alter it by artificially preventing it for several generations is bound to meet with failure. The inheritance of an acquired characteristic is doubtful in any case, and in bees the heredity is vested in the queen and the drones, while checks to swarming mostly influence the workers who leave no descendants.

Surprise is expressed at times that bees

gather honey in excess of their winter requirements. The last four seasons in this part of England supply the explanation. The honey surplus for the four years is only that of one good year. Wild stocks have mostly died out; and where a stock *has* survived without a bee-keeper's aid it is owing to the quite necessary habit of storing an excess in years of plenty.

Similar climatic conditions are probably responsible for the prevalence of the robbing instinct. It is undoubtedly better for the race that one stock should live through the winter at the expense of the four or five that they have "cleaned out" than that all should perish before the spring comes around again.

Like any other animals bred by man, bees are capable of being changed. To do so, however, it is necessary to start to work in the right way. Mr. Holtermann asks how many generations it will take to teach bees to dread smoke. If bees had not dreaded smoke, probably there would have been no bees at the present day. They would have been one of the species of insects that have died out. If we came across their fossil remains we should send them to the museums, and that would be the end of the matter. Having never known them we should never miss them. Mr. Pruitt refers to the continuance of lambs' tails as a clinching argument against the possibility of modifying the swarming habit. But have sheep-breeders ever tried to produce a bobtailed lamb? If there existed a demand for such an article I feel sure it would be supplied. Tailless sheep are no more unthinkable than hornless sheep. If there was any money in it, a chance variation in the length of a lamb's tail would very soon become the characteristic of a breed.

We could never teach an Italian queen to breed five-banded bees; but by taking advantage of a chance variation they have been produced. Nevertheless, we can not foretell the time it would take to repeat the experiments with another hive of bees. A scientific breeder in England once desired to change a breed of pigeons. The new variety was to be like the old in every respect with the exception of the color of the head. This was to be white instead of black. The fancier was twenty years accomplishing his task. Most of the time was spent in waiting for a white feather to appear in the head plumage. After that arrived his task was comparatively easy. It is just the same with bees. If we requeen from desirable stocks we perpetuate their qualities. If no stock has the desired quality we can only wait until the quality, or some modification of it, appears in a particular hive.

Until we go thoroughly into the question of natural selection and disease, we shall never understand the foul-brood problem and the apparently contradictory statements that are made as to immunity. The subject, however, is too big to tackle at the end of this paper.

Albury, Herts., England.



H. L. PARKS, OF THE FIRM OF METCALFE & PARKS, TAKING OFF HONEY IN THE "NEW MEXICO" WAY.

A NEW-MEXICO WAY OF REMOVING HONEY FROM THE HIVES AND CARRYING IT TO THE HONEY-HOUSE.

The Advantage of Finishing One Kind of Work Before Beginning Another.

BY O. B. METCALFE.

At the request of the editor I have taken a number of pictures to show our methods of taking off honey. The methods are not ideal, but they are practical, and, therefore, may be of some value to beginners. I specially invite adverse criticism, for in that way I shall hope to get something out of it.

In Fig. 1 my partner, H. L. Parks, is seen just going into a hive. He had previously thrown the cover on the ground back of the hive, and set his empty super on it; and when the picture was taken he was in the act of stripping off the canvas inner cover with one hand, while with the other he was giving the bees the first smoking they receive during the operation. He seldom stops to smoke the entrance while taking off honey—he can't spare the time. If you should happen around to one of our yards when he is taking off honey in a hurry you might think he had lost something which he was in a desperate hurry to find. We shake most of our honey when taking it off, and the method used is exactly the same as that described by G. M. Doolittle as to the quick downward thrust followed by a jerk back; but it will be noticed, Fig. 3, that the frame is, at one end, held so it rubs up and down on the end wall of the hive. This is a very important point, for it enables the operator to shake all the bees back into the hive. The frame when held thus will not strike against anything, and the bees all fall back into the super, where most of them busy themselves crawling down into the brood-nest. The points of advantage are that a lot of time is saved over the method of shaking on the ground in front, and fewer queens lost. The first frame is usually taken out somewhere near the middle, where there is the best chance to shove the rest of the frames away on either side.

Just a word about that canvas inner cover, Fig. 1. Nothing will beat it for this country. The bees soon cover it with wax so it is water-tight, and thus it forms the sealed inner cover. With good 12-oz. canvas any kind of old board will do over the hive for a cover, and the bees will prosper; but the strongest point in its favor is that, in rapid work in taking off honey, it saves the operator about half the stings he would get with any kind of wooden inner cover, because it strips off without jarring the hive, and the smoke is on the bees before they get the "fight idea" in their heads. I say it saves half the stings when the operator is working fast. A slow operator can avoid stings with any kind of inner covers; but a fast operator gets stung more or less all the time; and when he is jerking off from 2000 to 2500 lbs. per hour, any contrivance which



FIG. 8.—Carrying a super of honey in such a way that the combs will not wound each other, and cause bleeding or leakage from them while they are stacked away for several hours.

will cut down the stings one half adds very materially to his comfort.

The brushing act shown in Fig. 4 is one we seldom practice when in a rush. If there are not more than two or three dozen bees left on a comb when it is shaken, in they go to find their way out the best they can through the bee-escapes at the top of the big screen windows in the honey-house. Fig. 5 shows the frame of honey being set down in the empty super in which it is to be taken to the honey-house. In Fig. 6 the bees are being shaken out of the super from which the honey has just been removed. The empty super is then taken to the next hive to receive the shaken combs there. In Fig. 7 the cover is being put back upside down to allow ventilation while all the bees are crowded into the brood-nest.

Some time last year a correspondent mentioned a method for taking off honey which kept about three operators busy at a hive. No doubt the work was beautifully done; but so far as quick work is concerned there was a great loss of time. A fast operator practically jerks the bees off a comb as he lifts it from the hive, and a trial will show any one that he can set a comb down quicker than he can get another person to take

it. In Figs. 2, 4, 5, the proper place for a smoker will be seen. In this position it is ready to use almost instantly, and it goes along with the operator when he moves about the hive or walks a few steps away to any other hive, for he soon learns to walk about with his smoker between his legs. If a bee-keeper should come to me and ask me for a job of taking off honey and I noticed that his overalls were all smoked and scorched between the knees I would say "yes" without asking him a single question.

ADVANTAGES IN GETTING A LOT OF HONEY TO THE HONEY-HOUSE AND STACKED UP BEFORE BEGINNING TO EXTRACT IT.

We notice that all the bee-keepers who come around our work seem surprised that we take off all the honey and all the supers from a hive when we go to extract it, and leave it that way until we get back with the supers full of empty combs. It seems to be



FIG. 9.—Throwing back the canvas to load another super on the wheelbarrow.

new to them. Now, if the method is new to most bee-keepers I wish to say that it is worth getting acquainted with. To go out into a yard and take off all the honey in it, then extract it all, and finally put back all the combs in the supers they are to stay in, so greatly systematizes the work that the effect will please any one. A smaller crew can handle more honey, do it better, and with less robbing.

We have tried several ways of getting the honey to the house, and I believe that the common flat wheelbarrow is the best, except in times of the worst robbing, when each super should be carried in as it is taken off. If the supers are carried any distance they should be held with the end against the body, as shown in Fig. 8. Notice that the left hand is in such a position that the fingers can hold the combs from pounding against each other as they are carried. If the combs are allowed to pound or mash one another as they are being



FIG. 10.—Bound for the honey-house with a load of four full-depth supers and two shallow-frame supers.



FIGS. 11 and 12.—Passing the supers of honey through the canvas flap door of the extracting-tank.

carried into the house, some honey will be wasted by "bleeding" while the supers are stacked up. When the honey is wheeled in on the wheelbarrow, four or five full-depth seven-frame supers is our usual load; but a strong man can wheel more on good ground.

Figs. 11 and 12 show the operator passing honey in through the canvas flap door. One of the interesting things about this type of door is that, while it does not always hang right to close the door completely, the bees rob very little around it. Here is where the big screen windows come in handy in our honey-house. The bees go to the point of the strongest odor of honey, which is, of course, at the big screen windows. There is often a great whirl of robbers about these screen windows or screen sides while scarcely a bee will be bothering about the doors. The greatest advantage of the screens, however, is that they permit plenty of air. Our old tent with much smaller windows was so hot that we could scarcely stand it; but with the windows we have now we have not suffered at all from the heat this summer.

Mesilla Park, New Mexico.

BEE-KEEPING AS A HOBBY.

BY F. DUNDAS TODD.

Census reports show that three-quarters of a million people in this country are sufficiently interested in bees to keep at least one hive, the average being about four to each apiary. Most people will be rather surprised to learn that about one person in every hundred in the United States keeps bees; but should they ever catch the bee fever they will soon discover hives in yards near by where their presence was never suspected.

While there are, perhaps, a thousand men who depend upon raising honey as a means of livelihood, the vast majority are keeping bees for pleasure rather than for profit, contented to get a few hundred pounds of honey for family use. For many years the

writer's family has consumed 200 pounds of honey annually, in his opinion with highly satisfactory results, judging by the general health of the members. Honey is a predigested food, capable of rapid assimilation; better still, it is a natural laxative, deserving consideration from people of sedentary habits.

The average reader of the title of this chapter will, at the first glance, be tempted to move that it be amended by introducing the word "country" before the word "hobby." Bee-keeping as an occupation is undoubtedly a rural one, frequently very isolated, but it is just as often—nay, very much oftener—a city hobby, for in every one of our large cities there are men amusing themselves by caring for a few colonies of bees in back yards, on roofs of dwelling-houses—aye, even on the roofs of business blocks. The marvel frequently is, where do the industrious little insects get their food? But get it they do, usually with a surplus of delicious honey for the owner as a material gain that adds to the zest of the fascinating pastime. Any one within a mile and a half of a region where there are a few acres of clover or sweet clover, whether in the form of city park, vacant lots, or everyday unimproved streets, need have no hesitation in making a venture with a hive of bees with the full certainty that, from an investment of about twenty dollars, he will have not only a daily interest in living creatures, but once in a while a little mild excitement that will make him for the moment forget all his other troubles.

A hive of bees may be kept almost anywhere; but, of course, the most favorable location is out in the rural regions where flowers are in plenty. A hive is an attractive feature in the back yard, and, in the writer's experience, interferes in no way with its utility for other recreation. On a corner lot in a Chicago suburb he once kept four colonies near the back porch within 20 feet of the children's croquet ground, without any annoyance. Often a ball would roll in front of a hive and be fished out at

once in ordinary course without bother to either bees or children. Generally every day a dozen young folks would be playing about, but never one got stung.

Our honey-producing pets as a whole are not offensive, but they are adepts in defense. At present the writer has three dozen hives in a back yard in the residence part of a city of 40,000 inhabitants; but so far he has not had a single complaint from a neighbor. There is only one colony of wicked-tempered bees in the apiary, which will be eliminated at the first opportunity by replacing the present mother, generally known as the queen, by one raised from a gentler strain.

As has just been stated, the queen of the hive is, after all, merely the parent of the vast family. A bee-hive is a form of society in which there is apparently no government, no direction, no correction. Each inhabitant instinctively knows the right thing to do, and does it. Hence inside this magic chamber there is no immorality, no vice, no crime, consequently no rules, no government, and no overseers of any kind; and therein is the charm of a hive to the business man who needs a complete change of thought. It is not the little work essential to their welfare that makes bees a splendid hobby, because for weeks on end it is better for the bees if the hive be never touched; but it is the study of the social economy. At first there is the fascination that comes from watching the perpetual going and coming of its myriads—an attraction that tempts one to sit for hours in the

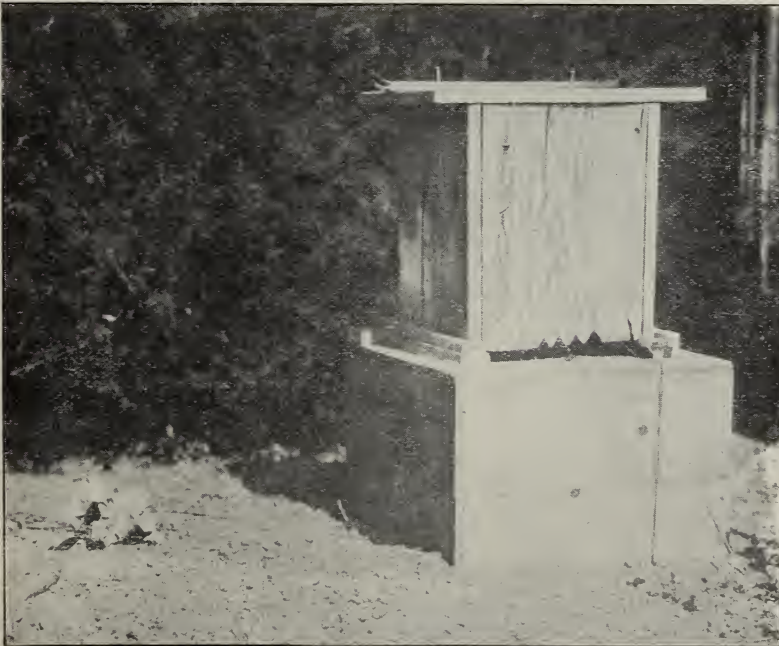
pleasant sunshine with eyes persistently fixed on the alighting-board, all other things being forgotten. Where do they go, what do they get, and how is it carried?

Then we are tempted out to the highways and byways, the open fields and clumps of woodland, to become acquainted with plants and flowers we never before heeded. We get literature to learn what others know, and are led to further observation on our own account. Lastly, we begin to appreciate the value of little differences, and so day by day we follow the changes that mark the progress of the bee year—the rapid increase of population in the spring; the development of the reproductive instinct, and its culmination by swarming; the advent of the honey-flow when nectar is so plentiful that the supply is far ahead of the daily needs, and so provision can be made for the long season of dearth by a wondrous system of storage; the ending of the season of plenty followed by a rapid shrinking of the population so that consumers may be few and not endanger the life of the colony by eating up the food supply when production is at a standstill.

It is hinted that some human beings, in their efforts to maintain a certain standard of living, are not averse to race suicide. In untoward seasons, especially in spring, the inmates of our hives are frequently face to face with collective starvation due to sudden stoppage of nectar, and at once they curtail consumption of food by child murder, mercilessly throwing out of doors every egg and undeveloped bee. Men may

die, but man must not, so bees must be sacrificed that the life of the colony may be perpetuated.

Enough has been said to indicate feebly the fascination a colony of bees has for its owner. The attraction is so great that, in the case of the average man, his hives are the first objects to be visited on his return home from business any day from the spring thaw until the late November frosts drive the bees into winter quarters. But there is a material side, minor in



A colony in a box hive which cost one dollar. This kind of thing had better be left alone by the beginner.



The penalty for buying a colony in a box hive: transferring it to a regular hive. The novice finds this a rather sloppy task with lots of stings as an incentive to haste.

importance to the true bee-lover, but major in the judgment of the multitude, and that is the production of honey—one of the most perfect foods consumed by human beings, undoubtedly their first sweet—one that, by those who understand, is partaken of as freely and as regularly as milk or jams. In some seasons the surplus honey of the hive available for human use is considerable; in others it is conspicuous by its absence; but taking the average of a series of years in almost every region of this continent, it amounts to 50 pounds, being excellent profit from a hobby that calls for moderate outlay of capital and very little labor.

The suburbanite who raises flowers and garden truck, or keeps chickens, has plenty of physical labor, generally gets some produce, but ordinarily has difficulty in showing an equivalent for labor and money expended. His profit is summed up in one word, "fresh;" that is, his household is benefited by fresh blossoms, fresh vegetables, and fresh eggs—doubtless all excellent things in themselves, as the writer knows by practical experience in both raising and using. But a bee-hive calls for little labor, and is interesting; once in a while when the bee-keeper is foolish it will give him a little run for his money; for even "heavy

weights" will sprint a hundred feet in almost record time when paced by a dozen bees anxious to make acquaintance with some specially tender spot in his anatomy; but it will, one year with another, pay at least 30 per cent on the outlay, and, with skillful management, nearer 100 per cent. Stings are not a necessary part of the returns; in fact, the writer as a beginner easily got more in the first week's ownership of his first hive than he now gets in a whole year from three dozen.

In most regions the best time to begin bee-keeping is in the end of April or beginning of May. Not only is it near the commencement of the honey-flow, which in most settled communities is from clover in June, but the risk of loss is at the minimum. Some years many

colonies die in winter or early spring, so that there is a certain amount of risk in buying after the honey season is past, and therefore it is well worth while to pay double autumn price in May for a colony in good condition, rather than pay half spring price in October. Then, if there be no objection to increase, one can usually trust for expansion by swarming, but each swarm will be compensated for by less surplus honey.

The beginner should buy only one hive, for one box of tricks is enough for any novice. If you wish to understand bees you will learn as much in the first year from one hive as from twenty; while if you let them run themselves your financial loss will be at a minimum. Bees are a kind of stock that require attention just like chickens, sheep, or cattle—not so frequently nor so regularly, by any means; but at certain times they may need assistance, which must be given at once and in full measure if the life of the colony is to be preserved. The man who can not take care of one colony and its increase for one year is lucky to learn his inability at small cost. It is, therefore, wise for the beginner in bee-keeping to start with only one colony; and after the first season to invest in increase only such money as the bees have actually earned.



FIG. 1.—Mr. Hand and Miss Fowls discussing his new scheme of swarm control.

The first colony should, if possible, be $16\frac{1}{4}$ inches wide, and $9\frac{1}{2}$ inches deep, outside measurements. This is the one to choose. Last of all, if possible, when purchasing, the market rather than an amateur who plays with a few hives, because the apiarist is more likely to have a strain of first-class workers. There are big differences in bees as in other animals, and the professional bee-keeper is compelled to eliminate the inefficient to make his occupation pay. As a class, bee-keepers are very honorable men whose word may be relied upon — rather free than otherwise in explaining the mysteries of their calling.

Do not be tempted to buy a colony housed in a soap-box or similar makeshift, but see that you get a modern hive in good physical condition, free from cracks and loose joints. There have been fashions in hives as in other lines of industry; but the bee-keeping world has, as a whole, settled down to one length and depth, using what is known as the Langstroth frame. Now, it is important to have all frames interchangeable, and therefore the beginner should avoid out-of-date, odd-shaped sizes. A ten-frame modern hive is 20 inches long,



FIG. 3.—"The proof of the pudding" of the Hand system.

make the bargain to include the delivery of the hive and placing it in position, and by this little bit of sagacity you will escape 75 per cent of the stings you are liable to get the first season. Herein the writer speaks out of the fullness of his experience, for his first investment was a derelict colony left behind by a neighbor who had gone out west. The purchase led him into a peek of interesting troubles, the first consignment of which was delivered by about one million bees on his ten fingers in one second—at least it looked that way. He is perfectly certain about the number of fingers, but did not take time to count the bees or the seconds.

Let us see the cost of a little venture in



FIG. 2.—"What is that side entrance for, Mr. Hand?"

amateur bee-keeping, stating the actual necessities for the first year, not quoting the lowest prices possible, but those taken from the catalog of a large and long-established factory with a reputation above suspicion.

Colony in ten-frame hive (in spring).....	\$13.00
(Note, cost in fall would be \$10.)	
2 comb-honey supers, complete..	3.40
1 smoker.....	.85
1 bee-veil.....	.60
1 pair bee-gloves.....	.50
1 instruction-book.....	1.25

\$19.60

Extra expense probable in average year.

1 new hive for swarm, all complete.....	\$3.30
Extra sections and foundation..	1.00

\$4.30

In all likelihood the first colony, if bought locally, will cost less by a few dollars than the price quoted. The first year's outlay should not be allowed to exceed \$30.00, of which sum all above \$22.00 or \$23.00 will be for new hive-bodies as a consequence of uncontrolled swarming. After the first year's investment, unless some very exceptional condition arises, the bees must keep themselves, and no expansion should be attempted unless the cash for the hives has been earned by the insects.

The source of revenue is, of course, comb honey. In an average year the production



FIG. 4.—The Hand feeder drawer.

will be about fifty sections; in a poor year, nothing; in a first-class season, one hundred or even more. The writer started out in a poor year, got two swarms and fourteen sections of honey. In the spring of the second year his three colonies were safe and sound, and by a little knowledge and luck he managed to avoid swarming; then he was fortunate enough to pick up a stray swarm that somebody had failed to keep track of. The season was said to be below the average, and he got from the three original hives 45 lbs. of chunk honey and 267 sections, worth locally over \$60.00. There was thus returned all the cash that had been invested, and four hives were still in existence.

So far for the rosy side of the shield; and now it is but fair to show the obverse. In a new locality the writer bought 9 hives; increased to 21, getting 75 lbs. of honey. It was a poor season; but the winter was worse, the average apiary in the locality losing 60 per cent of the colonies, the writer's included. The summer following was a complete failure. This happened in a region where, up to that date, a honey-dearth had been unknown for over a dozen years. This is why it is advisable for a beginner to limit his first season's investment to about \$20.00, and make all future expansion out of income—of course crediting the bees with all honey consumed at home at regular market prices.

The location of the bees in the yard is important. First see that it is sheltered from cold winds in the spring months; hence in most regions it should be shielded on the north by a fence, clump of shrubs, or house or barn. On the other hand, in the summer months there must be a free circulation of air all around, therefore the hive must be at least six feet from the fence or building. The position of the entrance is not really important, but it generally faces the south so that the sun's rays in spring will send warm air into the entrance; while as the end of the hive warms up, the heat will circulate between the frames. When the doorway faces east or west the noonday sun heats up a side, warming up the comb next to it, but not affecting in any way the middle frames on which the bees are apt to be clustered.

The hive must not rest on the ground, as the moisture will rot the bottom-board. A stand in the form of a table a foot or so high looks rather well; but a couple of pieces of 2x4 lumber, or 4x4, laid flat on the ground, will be just as good so far as utility is concerned.

Victoria, B. C.

J. E. HAND'S SYSTEM OF SWARM CONTROL.

The "Proof of the Pudding."

BY E. R. ROOT.

On pages 679, 692, 693, 719, and 755, the J. E. Hand system of swarm control by means of a switch lever and a double bottom-board

was illustrated and described. To refresh the memory of the readers we may say that the scheme consists of a double-width bottom-board large enough to take two hives side by side. There is an entrance on all four sides of this double bottom that can be manipulated in such a way as to throw the working force preparing to swarm from one hive on one side of the board, to the hive opposite. This trick is accomplished by the simple manipulation of a switch lever or gate.

When Mr. Hand first presented his scheme to us, a year ago, it looked good. We said, however, that we would like to see it in actual operation, and, accordingly, last summer we availed ourselves of the opportunity to visit his apiary at Birmingham, Ohio. On the day of our call we drove over, stopping on the way at Mr. Fowls' apiary, picked up Miss Fowls, who, after our description, was anxious to see the plan in actual operation. We tried to get a picture of her standing before one of the stacked-up hives, but succeeded only in catching her with her back to us. She had not forgotten that, a couple of years ago when we showed her picture in GLEANINGS, a number of single bee-keepers desired to correspond with her. The other members of her family have been "having the laugh on her" ever since. It will be noticed in two of the views, pp. 795, '6, that she is discussing with Mr. Hand this system. She was, in fact, entirely ignorant of what the camera was doing. Fortunately, we caught both of them in animated discussion over the new system. Mr. Hand's face shows plainly enough. If any of our subscribers desire to "correspond" with him they have our permission.

In brief, the plan of swarm control is this: When No. 1 on one side of the bottom-board arrives at a swarming pitch, the upper story with its extracting-combs is placed on the other side of the bottom-board hereafter designated as No. 2. The supers of No. 1 are then placed on top of No. 2 with a queen-excluder between it and the extracting or brood combs beneath. The switch lever is shifted over, forcing all the flying bees of No. 1 preparing to swarm into No. 2 in which there is very little brood, a lot of honey in the brood-nest, which must be carried above to make room for the queen to lay in. The flying bees immediately go on storing in the same set of supers on which they worked in the other hive. When this flying-bee colony or No. 2 arrives somewhere near the swarming-pitch, its flying bees and its supers are switched back to the first hive; but usually one shift, says Mr. Hand, is sufficient to break up the swarming fever for the entire season. The auxiliary entrances on each end of the bottom-board (see page 692, Nov. 1, and pages 795 and 796, this issue), are used only when both of the switch-lever entrances are closed against the one colony. Without the auxiliary entrances there would be no chance for the fresh infusion of hatching bees to be transferred over to the colony that is storing honey.

So far Mr. Hand feels that his plan of

swarm control is a success. Whether it will continue to show up as well in the hands of others, remains to be proven. The illustrations are a fair sample of the hives in the yard manipulated on that plan. The taller of the pair of hives in each case is the one that has received a shift of flying bees and the supers from the shorter one. The latter in the mean time has been put into an impoverished condition to cause it to destroy its cells and hatch out its brood. When this hatched brood is of flying age it is shifted to the other hive. If, however, the tall hive is preparing to swarm, its force of fielders is shifted into the hive of the newly hatched brood. The two forces of bees are then ready to do business in the supers that have been again transferred over.

Mr. Hand felt that he had solved the problem of swarm control, and, as an evidence, he pointed to the stacked-up supers on top of colonies that had never swarmed. They had nothing to do but fill super after super with fancy comb honey.

Some years ago, as our older readers will remember, the writer tried what was known as the Sibbald method of swarm control at one of our outyards. This plan had the same basic principle, but was not as convenient to work. The Sibbald scheme involved the idea of having the colonies arranged in pairs, one very much stronger than the other. When the stronger colony began to show evidence of its intention to swarm, it was shifted over to the place occupied by the weaker one, and the weaker placed on its stand. The supers on the strong colony were then given to the weak one. Theoretically, all of the flying bees would go to the old stand; the cells that were built in the colony preparing to swarm would be destroyed because it would be robbed of all its flying bees. But the scheme worked only partially. Some strains of bees would go back to their old stand in spite of the change of position. Right here Mr. Hand makes a decided improvement in the fact that in the switch-lever bottom-board he makes this absolutely impossible. After the shift of the switch lever the bees go back to precisely the same alighting-board that they did before, but they are *compelled* by the gate or valve arrangement, so to speak, to go into the other hive, whether they will or not. Here they find that there are no cells started, very little of brood, and, as they will not be likely to swarm without conditions being favorable to swarming in the way of swarming-cells and a congested brood-nest, they will go on storing in the supers.

A feature of the arrangement is that it allows the bee-keeper to use his old hives and equipment, the only change necessary being the switch bottom-board, which, we understand, is being made the subject of a patent.

In two of the illustrations, one particularly, Fig. 4 (p. 796), will be noticed a sliding-drawer arrangement under one of the hives. This is nothing more nor less than a feeder. It is pulled out for the purpose of filling with

syrup, and when once filled it is pushed back as shown in Fig. 3, p. 795. The feeding-trough is fitted into a shallow rim that rests under the brood-nest proper. In feeding back, Mr. Hand has used this kind of feeder, because, he says, he finds it much more satisfactory to place the feed *beneath* the brood-nest rather than on top.

It will be noticed, also, that our friend is using shallow brood-chambers. While he preferred these with his old system, he now says that with his new system full-depth bodies or Langstroth depth will give as good results as the shallow brood-chambers.

AIKEN'S HONEY-WAGON.

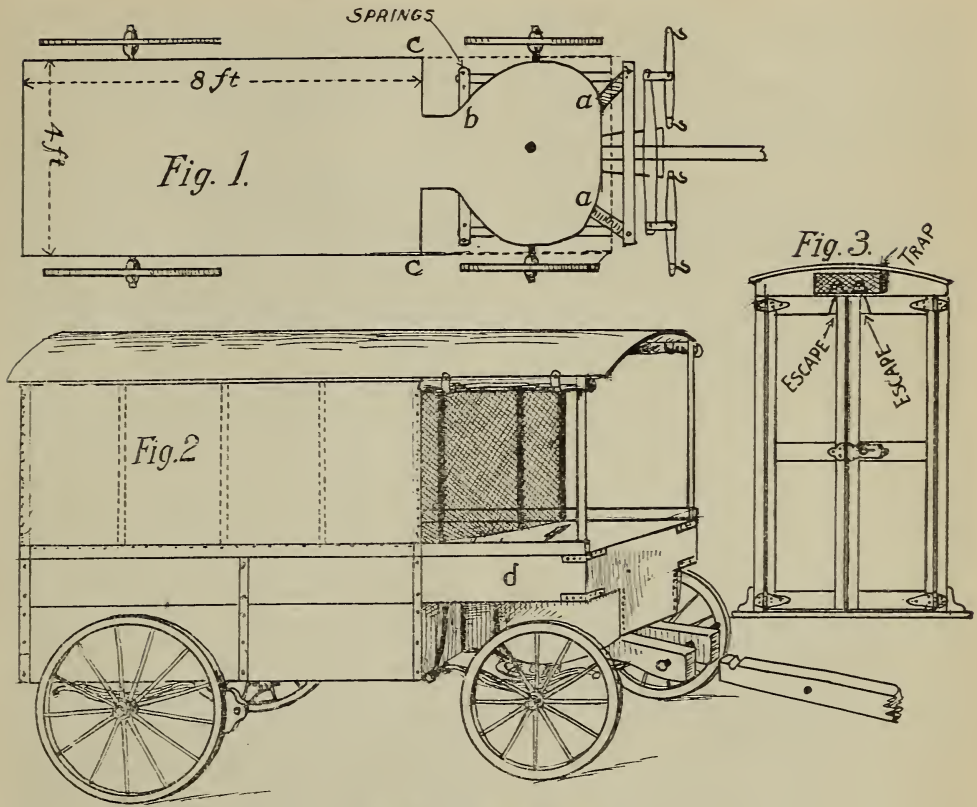
BY R. C. AIKEN.

If you do not have what you want, just make it. It often takes some thinking to devise short cuts; but if one never tries he is not likely to find them out unless some one tells him. I am decidedly in favor of independent thinking, but not the kind that makes one think there is nothing good except what he himself devises.

I have used my bee-wagon for a number of years, and have long intended to write something about it; therefore I can not be accused of rushing a new and untried apparatus before the public. It was built originally in 1896; but I rebuilt it a few years ago, and then made an entirely new wagon this past year, the box being 12 ft. long and 4 wide. In a bee and honey wagon it is necessary to have as wide a box as will go between the wheels in order to get all the possible room on the floor, and this means that the rear wheels must be high and the front ones low, or else some other provision made so that the wagon can be turned around in a small space. It is very important to have the box low for ease in loading and unloading, and also in order that the roof will not be so high above the wheels as to make the affair top heavy if enough space is allowed for a man to walk under it.

Fig. 1 shows the floor plan of the wagon, especially the circular part in front, which allows the wagon to turn around in almost as small a space as a dray, even though it is long-coupled. The wagon is equipped with full platform springs with no reach or coupling-pole, the springs and gear all being fastened to the box as in all ordinary full-platform-style spring wagons. The double-tree is attached to the gear, and the pole is a slip style, so that, by drawing a bolt, it can be quickly removed, leaving the double-tree always with the gear. This is a convenient arrangement, for, when the wagon is housed, the pole can be removed and put in it or under it.

Fig. 2 is a front and side view showing that the box is made square and full width in front, though still allowing the front wheels to turn under it. This cut-under plan is the peculiar feature that attracts attention everywhere I go. The curved part



AIKEN'S HONEY-WAGON.

from A to B, Fig. 1, is made of sheet metal. I used No. 16 galvanized iron, making two pieces by cutting in two a sheet 3 ft. wide. These metal pieces readily bend around the circle and give great strength to support the weight that comes over the front axle. The part from C to A may be made of metal or of wood.

The side board D, Fig. 2, is bolted fast to the circular sheet iron just over the front axle. As the iron recedes inward from each side, spaces are left into which boards are fitted and securely fastened to both the side board D and the iron, thus forming a shelf or ledge on each side on which the seat rests. The seat may be detachable or stationary. After trying both ways I prefer the detachable seat. In one of my wagons the front wheels are 38 inches high and the rear ones 42; in the other, 36 and 38 inches respectively. Of course, lower wheels would be all right. To get in at the front I climb up over the doubletree, using the hound or gear for a step. This would not be quite suitable for a common passenger wagon, but is all right for a business affair.

Another special feature of this wagon is the back end, which is shown in Fig. 3. Note that the vehicle has a hack cover, and that the sides are canvased in tight up to the part cut under for the front wheels. Just behind the seat is a curtain which may

be let down, closing the front end of the box, and at the back are two screen doors, which, when closed, make a bee-tight compartment. The reason for having *two* doors is that, when a door is only half as wide as the opening, a slight racking of the door-frame out of square will not leave a crack large enough for bees to pass. Moreover, when the doors are open they do not swing out far enough to be in the way. A catch at the top holds one door and the other one latches on to it.

Over the doors is a box used as a trap, each door being provided with an escape-hole at the top that lets the bees up through a cone into this box, which is just a plain wooden affair with a wire front. It is made detachable from the wagon so it can be taken down in a moment. When moving colonies of bees, if a leak occurs those that take wing and fly to the door are soon caught in the box; or, when taking off supers, if a few bees are left on the combs when put in the wagon they are soon trapped, as are also any robbers that get in. Without trying such a device as this, no one realizes what a lot of trouble it saves. I have put leaky hives in a wagon without making any attempt at closing them. I move right along and there is no trouble from flying bees. Most people would be surprised at the comparatively few bees that take wing when left open in the

wagon, *provided* they have been smoked or alarmed before being loaded. If a start is made soon after they are thus subdued they are all right. If the hives have stood for some time, and the bees have recovered from the smoking, they may be simply smoked again and there will be no trouble.

When reaching destination I remove the trap and put the bees that have accumulated in it anywhere I wish, giving them a queen, and thus making a nucleus colony. This same trap I use on honey-house doors and windows.

A few days ago I went into my wax-house in which I had left some combs of honey, and found that yellow-jackets were doing a rushing business. These little rascals will find their way where bees will not; but in going out they make for the nearest well-lighted door or window. I found that most of them were going out at a screen that had a cone outlet on it. I adjusted the trap box over that cone escape, and in less than one day had most of the yellow-jackets, and at the end of a week there were scarcely any of them around.

If one has never tried such a wagon as I have described, he will have little idea of the value of it when moving bees or when taking off honey. If a hive leaks, one can drive on or stop just as desired. When taking off supers I just put them in the wagon and they are safe from robbers.

Loveland, Colo.

BEE-KEEPING AS AN AID TO HEALTH.

Another Testimony to its Value; Stings Especially are Beneficial.

BY W. A. DUNTON, M. D.

Last February I had a severe attack of rheumatism which at first affected the muscles of the whole body, and soon attacked the heart itself, causing severe inflammation of that organ, or, as doctors say, myocarditis. The pain in my heart was sharp at times, with a dull pain always, and, on deep pressure, extreme tenderness. The action of the heart was so much interfered with that I was cold day and night in spite of four shirts worn constantly. A bath of tepid water seemed unbearably hot, so cold was the surface of my body. I suffered so much with cardiac asthma that some days I was unable to attend to my patients, and in my gaspings for breath I felt as though I were breathing with my heart, as that organ rose and fell with each respiration; and on those days it was only with the greatest difficulty that I could so much as walk. All these symptoms were made worse by eating strawberries or any other form of acid.

I tried all the best remedies known to medicine, but without relief. Any physi-

cian reading this will say at once, "Indigestion and faulty assimilation." True. The rheumatism was evidently caused by an excess of acids and toxins in the blood from faulty assimilation and poor digestion. I lost 11 lbs. in weight, and was pale and haggard.

Having practiced medicine for 18 years I hated to drop it and go to a place hotter than Southern California, or, perhaps, after partial recovery, go into some other business; but as I knew that my time on earth was likely to be short if my condition did not quickly improve, and knowing that sunshine and pure air would bring back my health if any thing could, I thought of bee-keeping.

I bought 46 colonies of bees near Los Angeles, in every imaginable kind of hive, and some in no hives at all, and went to work with them. It was early in the season; and as there was but little for the bees to eat they were savage, and stung me severely. From the first, improvement in my condition was marked. I threw away my veil and gloves, and took the stings in heroic doses. On one occasion I let them sting until I was nauseated. I have noticed the same effect on others. One day I had an eye closed, and my hands looked like twin toads.

The sharp pains entirely disappeared after the third or fourth large dose—from 30 to 40 stings at a time—and inside of one month all soreness went away. My good color returned, and I was cured. The chief symptoms noticed from the stings were heat, both local and general; itching, tingling, and formication—a feeling as of ants crawling over the skin—lasting for hours after a large dose, giving rise the next day to a feeling of added strength and vigor difficult to describe. The sweat poured off in rivulets, where before the skin was cold and clammy. My weight increased to my normal, 150 lbs., and my friends noticed my improved condition. I could eat acid foods without harm, and my appetite improved from the first.

I have not become entirely immune to the poison, although I am partially so. The pain of the entering sting is about the same as at first; but the local after-effects are much less, and the general effects almost *nil*.

For the benefit of physicians I will state that the poison of the bee is *not* formic acid, as has been stated by some observers, but an altogether different substance. If any one wants to experiment with formic acid obtained from an insect or other living creature he must obtain it from formica (the ant) and not from the bee.

The taste of bee-sting poison is pungent, but has not the sorrel-like sourness of that from the ant.

I have often tasted and smelled of both; and if the acid of the ant is formic acid, then the poison of the bee most decidedly is not.

Los Angeles, Cal.

Heads of Grain

from Different Fields

What is the Matter with the Bee-cellar? when Dampness does Harm.

Will you help me out by answering a few questions in regard to my bee-cellar? I have wintered in it twice, and I think it is too cold and damp. My cellar is 8 by 12, by 7 feet high, under ground, built up with loose stone covered with cedar posts, with two feet of dirt over a slanting roof. It stands on the east side of a piece of timber land, and in a side hill. The fact that it is close to the woods is what makes it damp, I think. It has a good drain laid with tile, but it gets quite damp toward spring. Here are the questions:

1. Does it need ventilation? How much?
2. Shall I leave on the bottoms of the hives?
3. Shall I leave on the covers with burlap or enamel cloth?

My bees are in twelve-frame hives, all Italians.
Mohawk, N. Y. CHAS. P. BROWN.

[In your description of your bee-cellar you state that the roof is covered with two feet of earth; but you do not say whether this earth has a roof over it. Without it, it would become water-soaked from rain and snow, and most of the time it would freeze up, and at other times it would thaw and let the water through into the cellar. The two-foot covering of earth should be covered again with a roof of its own.

The proximity of the woods to your cellar would have nothing to do with the dampness. The lining inside of the cellar, of matched ceiling, would probably have no effect one way or the other, except, perhaps, to make the cellar a little warmer.

One thing is sure: There is a lack of ventilation unless your climate is continuously cold for at least three months during mid-winter. When we say "continuously cold" we mean anywhere from 5 to 10 degrees below freezing for two or three months steady. The outside temperature must be cold enough so the inside of the cellar will never go above 50° F. On the other hand, it should never go below 40°. If you can maintain a temperature of not lower than 40° and not higher than 50°, you may be able to get along without much ventilation. In any event we would have a sub-earth ventilator, a glazed tile 8 in. in diameter, the joints made water-tight with cement. This should run 25 or 30 ft. away from the cellar, and then come to the surface. Be careful that this ventilator be tight so as not to carry water into the cellar. There should be a similar opening up through the roof. During very cold weather this ventilator should be closed from the outside. It will probably be unnecessary to use it except during moderate weather.

In your case, as the cellar is already built we would advise opening the doors at night and closing them in the morning during warm weather, or any time when the bees are noisy and flying out on the cellar bottom. If the cellar gets too warm inside, much above 50°, you will lose many bees on account of their flying out of their hives. In such cases the only thing to do is to give copious ventilation. For that purpose we know of nothing better than a sub-earth ventilator.

The dampness you speak of in your cellar will do no harm providing the temperature does not go below 40°. Some fine results have been secured in cellars reeking with dampness when the temperature was under control. The only time, apparently, when it does serious harm is when the cellar becomes too cold. Dampness and cold make a bad combination in any bee-cellar; but dampness alone is not necessarily hurtful.—ED.]

A New Kind of Bees instead of Robbers.

On page 635, Oct. 1, you are wrong in your conclusions; at least some bees that I am troubled with are not robbers, for they belong to another class, as they are smaller and different in color. They pounced in on two of my colonies for over two months; and although my bees killed large numbers of them they still kept coming. There was a two-weeks' honey-flow during the time, but

it made no difference to these strange bees, as they came just the same. They certainly do not seem to be robbers, as they have the appearance of only wanting to find a home. There are a great many of them living in some of the hives now and can be found on the brood-combs any time, seemingly as quiet and contented as the regular bees. My bees killed them when they were strange; but when a large number of them get into the hive and acquire the odor they stay. Where they come from is a mystery to me. Who can tell?

Joplin, Mo.

C. W. POWELL.

[Perhaps some of our subscribers who have observed the same thing can throw a little light on this. Before we determine what these insects are, we should have to have a dead specimen sent by mail. Prof. A. J. Cook, of Pomona College, California; Prof. H. A. Surface, State Entomologist of Pennsylvania, Harrisburg, or Dr. E. F. Phillips, of the Bureau of Entomology, Washington, D. C., could doubtless determine from the specimen sent what it was. In the meantime we suggest that our correspondent secure some specimens and send them in.—ED.]

Ordinary Sawdust Not as Good for Packing as Looser Material Like Planer-shavings or Leaves.

I have been greatly interested in your articles lately on absorbent and sealed covers. Could you tell me whether the following scheme is practicable? I planned to substitute for the regular cover a frame of pieces of wood one inch square, covered with a double layer of burlap tightly stretched. To prevent this from sagging I would nail on three or four cross-pieces. Then the bees would be packed in their winter casing. The space of three or four inches between the hive and sides of the casing would be filled with sawdust, five inches of this material to be put on top of the burlap-covered frame. Is this enough protection? The thermometer often goes down to zero. How big an opening would the bees so packed require for ventilation? Would the sawdust become too damp before the next spring when the hives could be taken out?

Haddam, Conn., Oct. 15. BERTHOUD BOULTON.

[Your scheme of winter packing we think would be all right; but instead of using so heavy a material as sawdust we would use something lighter and more of it. Sawdust is a little dense, and we should be afraid that in your climate it would become damp, especially if you use a burlap cover. It would be our judgment that it would be better for you to put on a tight board cover in place of the burlap, and then put on top about six or eight inches of loose packing material like wheat or oat chaff, planer shavings, leaves, or something of the sort.—ED.]

Wintering with a Super of Empty Sections over the Brood nest.

In preparing colonies for winter, is it a good plan to put a comb-honey super, filled with sections, on top of the brood-nest, and over this a super filled with chaff? or would it be better to leave off the super of sections? One of my neighbors here advises it; but it would seem to me better to leave it off, using only the super of chaff with a Hill device under it.

Orwigsburg, Pa.

S. A. RIGEL.

[Your neighbor's idea of putting on the super of empty sections was probably to afford a clustering-space for the bees; but we think that he would find some such arrangement as the Hill device much better. A space for clustering is all right; but too much of it would not be satisfactory, as the bees would only have that much extra space to keep warm.—ED.]

Artificial Bee-bread.

Will you please mail me a formula for making artificial bee-bread, or pollen, so that I can keep my bees rearing brood until late in the season?

Eldorado, Ok., Nov. 5.

W. R. WARD.

[There is no formula for making artificial bee-bread. Meal or bran—preferably meal from peas or beans—makes a very fair substitute. Ground rye is very often used. The meal is spread out in trays in a sheltered location as soon as the bees can fly. We have tried giving the meal in the hives, but never observed that the bees took much of it. They

will take it very readily outdoors, however, after they are once started, if it is put in a sheltered location. There are some early springs when the bees actually suffer from the lack of nitrogenous food. At such times they will hunt over feed-stalls, chicken-coops, anywhere and everywhere that they can get any thing that will serve the purpose of pollen in rearing brood.—ED.]

Why do Bees Dread Smoke?

The various opinions that have recently appeared as to why bees dread smoke are interesting, and some of them are amusing as well. I have no theory to offer as to why it is that bees may be thrown into a state of hopeless confusion by blowing a little smoke into the hive, but am satisfied of one thing at least—that heredity has nothing whatever to do with it. On various occasions I have given a live-bee demonstration in connection with a public lecture on bees. In every instance I have taken pains to explain in detail the movements necessary to bring a colony of bees under perfect control, and have usually ended by turning a painful of the insects over my bare head to illustrate the demoralized condition of the colony. Not long ago I took occasion to say to a large audience of teachers that I would not hesitate to try the same experiment with bumble-bees as well. It was freely suggested by friends who were familiar with the bee demonstration that the thing would not work with bumble-bees, and that for once I would get the worst of it. The opportunity to try was not long in coming, and a lot of bumble-bees that had made things so lively for others as to clear the field was brought to my attention. When put to the real test there was some lingering doubt in my mind whether, after all, it was not a risky thing; but there was no way to know but to try, and try we did. Without any protection excepting a loaded smoker we approached the nest. A brother bent on getting all the fun possible out of the experiment gave the bumbles a stir before we were prepared for business. The protest that came forth in the way of a buzzing declaration of war gave evidence that it was time to begin. The first bumble-bee to reach daylight was greeted with a puff of smoke that instantly made him forget he was looking for trouble. Several puffs of smoke were then blown into the nest, and the smoker laid aside. The nest was then taken apart and the combs held in the hand. The bumble-bees were apparently affected exactly as are the honey-bees under similar circumstances. Some of them buzzed about and alighted upon my clothing; others climbed over my hands, but not an individual in the lot showed the least inclination to sting. It is very evident that heredity played no part in the taming of the bumble-bees, for their ancestors, probably, were never smoked. It is very apparent, on the other hand, that the same influence is felt by both the honey bees and the bumble-bees.

I am now awaiting an opportunity to try the same experiment with some of the carnivorous wasps, like the bald-faced hornet, to see whether they will be affected in the same way or whether the smoke is valuable only in subduing the honey-gatherers. I have also in mind similar experiments with some other insects like an ant community to see whether, under the influence of a little smoke, they would stand idly by and see their fornicary broken up without protest.

Atlantic, Iowa.

FRANK C. PELLETT.

[Our correspondent is a lecturer of some note on various nature topics, including bees especially. He has given bee demonstrations many times; and, judging from the press notices on his circular, these attract more than ordinary interest.]

Some have expressed the opinion that the bees' instinct to fill up with honey at the smell of smoke is handed down from generation to generation on account of the necessity of changing location at the approach of a forest fire. For instance, see the discussion by G. W. Bullamore, page 787.—ED.]

Odor from Goldenrod Honey.

In your answer to F. D. Miller, page 670, Oct. 15, I guess you are wrong. I think the odor is from goldenrod honey. My bees have gathered lots of it this fall, and at times the odor has been most offensive to neighbors.

Barre, Vt., Oct. 19.

H. WILLIAM SCOTT.

Keeping Entrances Free from Snow.

In this section, as a rule we leave our bees out in winter, and we have to be careful that the snow does not fill up the entrance and exclude the air. Is there any contrivance to prevent the snow from filling up the entrance-opening? I have a shed with the west side boarded up and covered for my bees, but the snow will drift in and around the hives. I have only about 25 colonies; but it is a good deal of trouble to keep the snow away in a stormy time.

Goodland, Ind., Oct. 3.

DR. M. L. HUMSTON.

[It is a rather difficult matter to attach any thing to the entrance of a hive to keep it from getting stopped up with snow. Such device is almost always more of an objection than a help. Perhaps you might use absorbent cushions instead of sealed covers; and then if the entrances do get closed your bees will not smother. Ordinary packed snow gives no trouble, although if there is continual thawing and freezing, so that the entrances get clogged with ice, it is best to clean them out.—ED.]

One Thousand Pounds of Sugar Fed Between Fruit-bloom and Clover.

At the National convention at Albany, Mr. J. A. Green told how he made a big gain by feeding 1000 lbs. of sugar between fruit-bloom and clover. Do you think he did this for stimulating purposes, or because the colonies really needed the stores? Our fruit-bloom lasts until about June 1. It seems to me that this would be a little late for the best results. Bees from eggs after June 1 would hardly be honey-gatherers for clover, although they would be all right for basswood. Please give me your opinion as to Mr. Green's object. I have written to him, but so far have received no reply.

Oswego, N. Y.

F. H. CYRENIUS.

[We would take it that Mr. Green in mind stimulating brood-rearing, and filling the brood-nest (that was not occupied with brood) with sealed stores and sugar syrup. In this way when he came to the honey harvest the honey itself would necessarily have to go into the supers. In this way he could get all the honey from the fields into marketable shape instead of some of it in the brood-nest and some of it in young bees and brood. Syrup is far cheaper than honey; and when it is possible to trade syrup for honey we are making a good business deal.

You will remember this same general plan was advocated by Mr. H. R. Boardman some ten or twelve years ago. At the time, it was called the Boardman plan of feeding to get more honey. The objection raised to it at the time was that the bees would carry some of this sugar syrup into the supers; but if feeding were discontinued in time, and the sugar stores were sealed, there would be no danger.

If we have not properly interpreted Mr. Green's idea he will be given an opportunity to explain it himself.—ED.]

Sweet Clover; Liming the Ground, etc.

I notice on page 421, July 1, a comment on yellow sweet clover sown in November, 1908, that bloomed in June, 1909. This prompts me to tell of my experience. I have been trying for years to get white sweet clover to grow on some acid land, but with poor success. Judging from something I saw in print, that the yellow clover might take more kindly to the acid land, I bought some of you last winter and mixed it with seed of the white kind of my home growing. This mixture was sown after Jan. 1 on two fields of poor clay soil, which, however, I had limed at the rate of 1000 lbs. and 500 lbs. per acre. The seed came up fairly well; and, examining the plots on June 27, I found a large number of blossoms on the yellow sweet clover. Of course, I do not know whether they all bloomed. There are several plants not blooming, but they may all be of the white kind. I should add, however, that this yellow sweet clover in bloom was from three to six inches high only.

D. W. TAYLOR.

Naval Constructor, U. S. N.
Washington, D. C., July, 1910.

Our Homes

By A. I. Root

Give thanks unto the Lord, call upon his name, make known his deeds among the people.—I. CHRON. 16:8.

O give thanks unto the Lord; for he is good; for his mercy endureth for ever.—I. CHRON. 16:34.

Our Lord Jesus Christ was a son of David; and in reading over this 16th chapter of I. Chronicles I was wondering if I too were not "a son of David." Of this I feel sure, that David and I have many feelings in common. Day after to-morrow is Thanksgiving day, and it is, therefore, quite proper and natural that I should think of "giving thanks unto the Lord;" but there is one particular reason why I feel thankful this bright morning, for I have great faith that I have made one more "great discovery," and a discovery that may ultimately prove of much benefit to the children of men.

You may remember that I have several times, as the seasons came around, spoken of how much I enjoyed chestnuts, and how beneficial they seemed to my health. This season they were so scarce and high-priced it seemed almost extravagant to enjoy my favorite nuts. I think I paid 40 cts. a quart for the first; but I afterward received four quarts for a dollar—nice ones—and a dollar's worth were brought down here to Florida. When they were almost gone I told Mrs. Root I still considered them (roasted chestnuts) the most delicious food God had ever given mankind, and that I should feel very much lost when they were gone. Now right here I want to make a considerable digression. Some time last winter I saw the following in Crenshaw Brothers' (Tampa, Fla.) seed catalog:

CHUFAS.

In the light gray sandy soils of our State, unaided by fertilizers, with fair cultivation on land that will not produce from 5 to 10 bu. of corn per acre, chufas will mature 50 to 100 bushels, with but half the cultivation that corn requires. They are an excellent hog food. Chickens and turkeys are also especially fond of them, so that a crop, when grown, can be fed both to poultry and hogs. The flesh of the chufa is especially juicy and delicious. Chufas can be planted from March to July, and a crop made. Plant in 3-ft. rows, 1 to 2 seeds 18 in. apart. It requires about one peck per acre. Qt., 20 cts.; peck, \$1.25; bushel, \$4.00.

Before taking up the chufas as indicated above, please pardon me for making *still another* digression. I am writing this Home Paper with (perhaps for the first time in nearly thirty years) an up-to-date typewriter. In my first letter home I said, "Please excuse bad spelling and mistakes," not because I did not *know* how to spell and punctuate, but because the new "contrivance" would not *say* just what I *meant* to say. Now, then, I read that statement in the catalog much as I wanted the people in Medina to read my typewriter letter—to make due allowance, because it was seedsman's catalog. Notwithstanding, I got considerably

excited about chufas. After reading the statement over several times I sent for half a peck, and planted them at intervals, until May. They came up rather poorly until the very warm wet weather came on; and when I got back here again in July I found some of the hills a yard high and almost a yard across. I suspect these large hills, however, were where Wesley got a pretty big dose of poultry manure all in one place. With every hill like these few, the yield might be something like the amount mentioned in the catalog; but in our soil, we so far find it a lot of work to dig them. By the way, I raised chufas when a boy, more than fifty years ago, and I used to think then they were almost equal to nuts when dried, and I have used them here quite a little in the place of nuts. There has always been one trouble however—the outside coating is hard, and obviously hard to digest, even if you do chew it "everlastingly." In spite of all I can do, dear reader, I fear there must be still *another* digression. You probably all know how much has been said about the importance of using whole-wheat flour; and Terry, for the same reason, eats raw wheat that he may get the whole or nearly the whole of that outside shell put there, by the great Father, because he intended it for food. Our good neighbor, Rev. Ten Broeck, tells us that the rice of commerce is spoiled in the same way by polishing off the most valuable part; and Upton Sinclair said somewhere that he was obliged to eat the peelings of apples and potatoes in order to get a proper amount of coarse material in his food. For the same reason, cows and horses must have hay as well as grain or they can not thrive. Of course, *potato* skins must be properly *cooked* to be used for food; and away back when we children roasted potatoes out of doors I discovered that the paring, properly cooked, was the sweetest and most delicious part of the whole potato—that is, "when chewed a long while." You see that, even when a boy, I was *almost* on to Fletcher's and Terry's "racket." Well, now for my discovery: When chufas are baked in the oven, something as we roast peanuts, the outer covering is not only easily masticated, but the nut is to me even more delicious and nourishing than roasted chestnuts. In all our northern cities, and possibly in southern cities also, roasted chestnuts are sold on the street as a great delicacy. Now, if the merits of roasted chufas were well known I feel sure they would prove at least a successful rival, and far—yes, very far, ahead of the peanut, which is such a great staple the world over.

One thing more: I have all my life had more or less trouble with constipation. Once when castor oil, raw wheat, and even plenty of my favorite apples failed, and I was unwilling to resort to drugs, I applied to Ernest, as he usually has a remedy for almost every thing. He directed me to eat a lot of coarse wheat bran; and if I wanted a quick result, to swallow a lot of it without much chewing. It very speedily brought about

the desired result. If we want to clean a bottle inside, we often use sand or sawdust, sometimes both; and while such means are all right for the bottle, one should be careful in the use of so simple a thing as bran in this way—that is, one may do harm by the *too frequent* use of such a remedy. Well, the use of roasted chufas seems to be the best thing in this line I have ever gotten hold of. It is nature's remedy, God's remedy.* Some of my friends have been worrying because I don't get fat on two meals a day. Well, if I continue to enjoy them as I do now, I expect to fat up, something as our pigs used to do when the country was new and we turned them out to feast on the "shack" that they were sure to find in the woods.

Much has been said in the papers lately about its costing so much to live, and I am having many letters asking if it costs much more to live down here in Florida than it does up north, etc. Don't you see how beautifully my great discovery comes in right here? Raise chufas in your back yard, and have the richest and most nourishing as well as delicious food God ever gave to man.† Of course you can not live on chufas alone; but I have something to tell you further. My neighbor Raub, the old gentleman who did so well with the incubator, planted a little patch of upland rice in a part of his garden. Well, after he got back to Florida a few days ago he harvested his rice and he had about three bushels. It almost took my breath away. When I asked him how much fertilizer he used, if I remember correctly he said he used only what those chickens produced that he hatched in that incubator. Thinking rice ought to be cheap where it grows like that, I asked how low I could buy broken rice for my chickens; and after I got 100 lbs. for \$3.00, another neighbor, Mr. Abbott, told me he bought on "bargain day" 40 lbs. for \$1.00. We have been using this broken rice on our table, and I find it just as good as any rice so far as I can see. It is absolutely clean pure rice, and nothing else.

Well, dear friends, I have in this Home paper mentioned just a few things that

should cause us to repeat the words of our text, and it is not because I can live here so cheaply and with so much comfort and enjoyment, but because others, who may have but little to spare may do so—elderly people like myself who can keep chickens, grow rice* and chufas, and stay out in the open air, all day long. Even if Thanksgiving day is past and gone when your eye meets this, can you not stop a minute and say with me, "Oh give thanks unto the Lord, for he is good; for his mercy endureth for ever"?"

Poultry Department

By A. I. ROOT

GETTING A PREPONDERANCE OF PULLETS, ETC.

You ask in your poultry department, Oct. 15, why, in crossing certain breeds of poultry, you got a preponderance of pullets. I have given the matter much thought, and from my own experience in cross-breeding I would explain it in this way: The strongest blood will prevail; or, to use an old expression, "Blood will tell." The S. C. W. Leghorn is a distinct breed. It has been a Leghorn for hundreds of years. Its qualities are firmly fixed, giving it power to transmit those qualities. While the Buttercup (I do not know its history) may be made up of the blood of several breeds. Likewise the Plymouth Rock-Wyandotte cross. While the Plymouth Rock is not a distinct breed, it is an old-established breed, while the White Wyandotte is of but recent origin.

You can, and I hope you will, prove this by crossing a Leghorn cock with your Buttercup hens, or a Plymouth Rock cock with Wyandotte hens. Be sure your cocks are pure blood, when you should get mostly males. Your discovery may be very valuable.

There is so little if any profit in Leghorn cockerels, and they annoy the pullets so much, I often kill them as soon as I can distinguish their sex, which is about two weeks. I knew I could get color, size, shape, and many other qualities by crossing; but I was too thick-headed to see that I might get *sex* too.

I hope you will experiment some more, and let us know the results. I would advise you not to cross white and brown egg breeds. I do not like cross-breeds; but if they will turn us more money I may grow to like them.

Somerville, N. J., Oct. 22.

L. B. THATCHER.

Thanks for your kind suggestion, friend T. It fully accords with the crosses I have here in Florida. Very few males and pullets are mostly white, with green legs.

*Terry says there should be a movement of the bowels at least once a day, and that twice a day is much better, in order that all refuse and unwholesome matter may be out of the system as speedily as possible for the most perfect health. As a rule, wild as well as domestic animals are seldom troubled by constipation; and the reason is, they take the berries, grains, and fruits whole as nature furnishes them. Can we not learn a lesson from them?

†In a recent issue I had something to say about "emergency foods." Well, the chufas should be roasted over a quick fire or in a very hot oven, so that this tough outer coat will become crisp and easy to chew up fine, something like the peeling of a roasted potato. This baking process drives out all moisture to such an extent that we have a very concentrated food—more nourishment in small compass than even with the parched corn, if I am correct. When Gregory, the veteran seedsman of fifty years ago, first advertised and described chufas he called them earth almonds; and although they grow in the ground I should call them a veritable nut, and I hardly need tell you all late tables giving the amount of nourishment in different foods place nuts far above every thing else.

*I make below another clipping from Crenshaw's catalog in regard to growing upland rice in Florida:

"*Upland Rice*.—Very popular in this State, and a number of small areas are grown for home use as an auxiliary crop. Should be cultivated on every farm in our Southern country. Several years' experience has demonstrated the fact that rice can be as successfully grown on high lands as elsewhere."

"*Directions for Planting Upland Rice*.—On lands that hold moisture well, such as waxy or post-oak land, plant anywhere. On dry or sandy land, rice is planted in the low places. Prepare the land and cultivate as for corn, except the rows are only 22 to 24 inches apart so that one furrow in each middle, with an 18-inch sweep, usually suffices for a working, and the hills just far enough so it can be hoed. Plant as early in April as you can. Furrows are opened and the seed covered in any way most convenient at the time, just so the seeds get a little dirt over them. Drop 15 or 20 seeds in each hill, and leave all that come up. Cultivate for moisture and to keep down grass and weeds until rice begins to head. It usually ripens the last of August or early in September. The color tells when it is ripe."

BLACK CHICKENS FROM A WHITE FATHER AND PLYMOUTH-ROCK MOTHER; MORE ABOUT IT.

Dear Friend:—There is nothing new nor wonderful about your black pullets. You have simply stumbled upon an old law of heredity, or reversion, that has been familiar to breeders of thoroughbred fowls for fifty years. Darwin says in his "Variation of Animals and Plants under Domestication" that the progeny of a first cross always reverts to one or the other of the original ancestors." Now, the original ancestors of the Plymouth Rock fowls were a Dominique cock and a Black Java hen, so you see that any cross made with a Plymouth Rock must revert or hark back to the original maternal ancestor, the Black Java hen? But I wouldn't let a little thing like that worry me. You are only fifty years behind the times. Keep on; you will catch up by and by.

Ashbourne, Pa., Oct. 22.

W. E. FLOWER.

I do not feel "worried" a bit, friend F., for you know that "acknowledged ignorance is the beginning of wisdom." But, my dear friend, you have not touched upon my *great discovery* at all. You have explained, and doubtless correctly, why those chicks were all black; but my "great discovery" was in getting a hatch that is all pullets, or nearly all. Another good friend sends the letter below:

Dear Mr. Root:—I always read with interest the poultry notes which you usually give under "Our Homes." As to the "pullet" theory suggested in the Oct. 15th issue, without *knowing* any thing about the matter I am skeptical, and inclined to believe that the coincidences therein cited are accidental. But my opinion is not worth much. The object of this letter is to induce you, if possible, to pursue the study of the cross-breeds (the Wyandottes and Buttercups) a little further, and then see what you have.

I am inclosing you a short piece from *Harper's Weekly* for June, 1908, describing the experiments of Johann Mendel; and it seems to me you have a splendid opportunity to follow his methods of selection, and then publish results.

Versailles, Ky., Oct. 24.

J. W. CRENSHAW.

It seems from the clipping mentioned that I have been blundering on to the celebrated law of Mendelism. This paper suggests that the first cross will follow the dominant parent. Now, I do not know exactly what "dominant" means in this case; but perhaps I can help things by telling of an incident of yesterday. Before going to Florida we hunted up all the cockerels that were hatched during the summer. Out of something over 100 chickens raised, there were about 20 cockerels having full-blood Buttercup father; and, strangest and most wonderful of all, there was not a cockerel with a Buttercup *comb* after the fashion of the father. I supposed a cross between Buttercups and White Leghorns would, some of them, show the distinctive Buttercup comb.

Now, in the above the White Leghorn mothers ought to have been what Mendel calls the "dominant parent;" and as the mothers were all females (I did not mean this for a joke) is it any thing strange that a large percentage of the chicks were *pullets*? and even of the few eggs that produced roosters, not one in twenty had a Buttercup comb nor any thing like it, only a plain single comb like all the full-blooded Leghorn cockerels.

While I was considering the above, somebody in one of the poultry-journals (I think it was the *Petaluma Weekly*) said that we

want just now a strain of fowls that will be *all* pullets—no males. We have several strains of non-sitters, and why should we not now in like manner have a strain that will give all pullets? Perhaps we should have to have a male occasionally to keep up the strain. Who is going to be the first to announce all pullets for the egg-farm? and perhaps at the same time we can have another strain that will be all *males*, or at least 90 per cent of them, for broiler establishments.

BLACK CHICKS FROM WHITE-WYANDOTTE FATHER AND BARRED-ROCK MOTHER.

I just finished reading your "chicken" page in GLEANINGS for Oct. 15. I can give you some more evidence of those *black* pullets from full-blooded White Wyandotte cockerel and Barred Rock hen.

We had always kept Barred Rocks till a few years ago, when we decided to change to White Wyandottes. We began with one pen of pure-bred, and after the mating-season was over they were allowed to run together. This occurred for two different years. Of course I was astonished when the cross-bred chicks were as *black as crows*, and kept their color. They made very fine-shaped hens and excellent layers. Of course I prefer any kind of animal or bird of pure blood to a cross, so we finally got to all White Wyandottes and no Barred Rocks, and we are well pleased with the change.

Laharpe, Ill., Oct. 17.

J. S. CAMPBELL.

Thanks, friend C.; but you have omitted the most important part of the matter. Did you have more pullets than roosters? And, by the way, something else may come in right here. Philo, in his book, says an "old male bird," with "30 or 40 lively pullets," will give more pullets than males, and *vice versa*. Has this been sufficiently tested to decide the matter? Where are our experiment stations—those that are making a study of poultry?

BUTTERCUPS, ETC.

Since the editor has so kindly taken up the discussion of Buttercups I shall venture a few remarks which, if not interesting or instructive, may in part be verified by Mr. Root, who recently visited me at Toledo.

Three years ago we had Rocks and Reds of good strain, but were dissatisfied with our egg-production. Undoubtedly we had our ideals too high, which were augmented by reading poultry literature of enthusiasts who had stock and eggs for sale.

To increase the yield we purchased year-old Leghorn hens of good stock, expecting to have fresh eggs all the year. This met with little better success than before.

About six months after purchasing the Leghorns I reluctantly bought Buttercups, adding these to the flock, giving all the same care, diet, housing, range, etc., so conditions, whether good or bad, should have been proportionate. I soon learned that I had an exceptionally good strain of Buttercups or the reverse of the other breeds. But on investigation I found my Rocks, Reds, and Leghorns about the average, some reporting better results, others the same, and still others poorer.

I keep a few Rocks and Reds for mothers, as Buttercups are not reliable for this branch of the poultry industry. From the standpoint of the poultryman I think they can be called absolutely non-sitters; but I have had two hens and a pullet which clucked and seemed broody for three or four days, but during this time they were on the nest but little.

I am not making comparisons among other brood than those mentioned, nor claiming that Buttercups as a whole will excel all other birds as individuals; but taking them as a unit they more completely fulfill my requirements than other breeds, because I find them quiet, gentle, and not inclined to wander. On little range they do well.

The conditions which make other chickens most

successful will apply to these. They are beauties from the time they are hatched. I keep them in sanitary quarters and on free range.

Toledo, O., Nov. 2.

H. V. MEEKER.

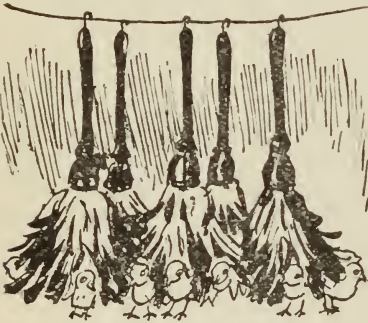
RAISES CHICKS BY FEATHER DUSTERS.

The Cleveland *Plain Dealer* has a special department for preposterous stories. One was about a hen laying three eggs a day, and things of that sort that nobody is expected to believe. Well, a few days ago when they undertook to tell one of their whoppers they blundered on to telling the truth and did not know it. Below is the item and the picture that came with it.

Probably the oddest idea ever made use of in the raising of chickens is a plan operated successfully by Mrs. John Krantz, who resides near Canal Dover.

Wishing to have the mother of a brood of chicks hatch another setting of eggs, the peeps were taken from the mother and placed in a coop in which were suspended a number of feather dusters just reaching the floor.

The young chickens huddled together under the dusters, and were kept as warm as if they had been taken care of by the mother hen.



Now, my opinion is that this good woman actually *did* raise chickens successfully with a feather duster, and I wonder somebody has not caught on to it before. A brooder made of feathers would give the chickens protection for their little bodies, and abundance of fresh air at the same time, in a better way than any thing in the way of lampless brooders or any thing of that kind that has ever been brought out. Do you suggest that there are not feathers enough to go around? Well, if all the feathers that are wasted and thrown away were saved, or if they were picked off the mature fowls just about or a little before the moulting time, there would be an abundance of feathers to brood all the chickens that are hatched in the incubator. Can somebody invent a fabric that will not cost much, with feathers interwoven, so as to hang down over the chicks?

SULPHUR FOR INSECT PESTS, ETC.

Let me give you a simple and inexpensive remedy that will cause your chicks to be free from the pests all this summer and all time to come if you keep it up. Give each grown chicken one teaspoonful of sulphur three times per week in some dough or bran mush, and the little fellows in proportion to size and age. Thoroughly disinfect your poultry-house and yards, and your chicks won't be bothered any more with insects. My wife has been using this remedy for ten years, and never has a mite. If

you start early in the spring, the houses will need no cleaning in that respect.

Waldo, Ark.

G. G. KOONES.

My good friend, we give place to your remedy; but I shall have to confess that I have not very much faith in banishing pests by something that is fed to the chickens. I can readily understand that any thing that would give the chickens better health and more vitality would enable them to resist both insects and diseases. Years ago, when the itch was a common thing with the human family, our mothers used to give us sulphur and molasses; and I believe that, at the same time, the body was anointed with some kind of ointment. Now, did the sulphur, taken internally, have any thing to do with the cure? that is, does sulphur taken with the food get into the circulation so as to show its presence on the surface of the body and thus repel insects? I wish some competent scientific authority, such as our experiment stations or leading poultry journals, would inform us. We thank you all the same for your suggestion.

HEADING OFF "VARMINTS," BUT LETTING CHICKS GO IN AND OUT AT WILL.

Referring to GLEANINGS for Nov. 1, page 710, as to Smith's method for chickens getting into the house by a board to walk up, and be removed after they have gone in, I will say the board is perfectly useless, and a waste of time, putting it there and taking away daily. After using it a few times the chickens will fly up themselves. Simply fasten your main door and let theirs alone. I have used them just that way many years.

Paducah, Ky., Nov. 2.

W. M. JAMES.

CHEERFULNESS IN SPITE OF DISASTER.

Losing so many bees last winter (20 hives out of 24) struck me pretty hard. Such is the fate in all transactions. The farmer, the mechanic, and merchant all meet with some disaster some time or other, and I shall not complain of my loss. I am an optimist.

Oh happy days! make no complaint:

They're always where you think they ain't.

Gnadenhütten, O., Oct. 12.

JACOB HECK.

The above comes from an old soldier who is partly crippled by a gunshot received 48 years ago. We commend him for his cheerfulness under discouragement, and offer a hearty amen to the sentiment of the original poem. By the way, this same friend sent us a little book giving an account of the shameful massacre of a community of Christian Indians over a hundred years ago. A missionary succeeded, during the early days of the settlement of Ohio, in building up a church and converting the Indians to peaceful avocations. If I am correct, a lot of drunken soldiers came upon those people when they were unarmed, and when they did not even attempt any resistance, and shamefully put to death a little settlement at Gnadenhütten, including men, women, and children. The whole thing was an awful disgrace, not only to the new State of Ohio, but to the whole United States. A beautiful monument now stands in the center of the little town to commemorate the awful tragedy.

High-pressure Gardening

By A. I. Root

HIGH-PRESSURE CORNFIELDS AND—HIGH-PRESSURE RATS.

On page 572, Sept. 1, I closed my article on cornfields by saying, "If you can come and take a look at our cornfield to-day you will see that I practice what I preach." When I wrote that, my cornfield, especially the part of it that was planted early, as I have before explained, was about the best of anything in the region roundabout. The great heavy ears were bending over toward the ground, and the whole field of several acres was making a pretty fair show, although we did lose quite a little money by not getting the *whole* field planted just as soon as it was marked and ready to plant, as I have before explained. Well, a few days ago I said the corn was ready to cut, especially the two acres planted first; and yesterday, Sept. 19, our men went out and commenced cutting. After they had been at work a little while I went down to give directions for saving the ears of seed corn. Just a few days before, Mr. Calvert gave me notice that the *birds* were making fearful havoc on that corn. When I got over to the edge of the field and saw ear after ear with the husks stripped back, and a great part of the grain gone, something seemed to say to me that this was *not* the work of birds. I began walking carefully out into the field, speculating meanwhile as to what sort of animal could be eating the corn that way; and then all at once I saw a big rat at work on an ear of corn. He was big and fat because he was a "corn-fed" rat. I thought at first he must be a muskrat from the creek near by; but as he turned around and climbed down the cornstalk I was satisfied he was simply a splendid specimen, in excellent condition (?) of the common rat described in the bulletin from the Department of Agriculture, which tells us that rats are robbing our farmers of over *one hundred million dollars a year*. At the rate this gang of rats was eating up and damaging my nice corn, I could readily imagine that the loss might be up near that enormous figure, especially if this work is going on all over the land.

Let me remark right here that our buildings are all made now with cement floors—barn and stable and cellars—so that the rats are practically barred out. These rats were doing the work out in the field at quite a little distance from any house or barn. Remembering what was said in GLEANINGS a short time ago about feeding rats on corn meal and plaster of Paris, I at once prepared a batch and placed it on wooden dishes in different parts of the field. While doing this I investigated a little more closely. In several places these rats had picked out the chit or germ of the kernel, and dropped the rest on the ground. With rat shrewdness

they had discovered where the best and most nutritious part of the corn lay; and good nice yellow grains of corn were scattered all over the field on the ground with just the chit torn out. This being the case, how much attention will the rats be likely to give to my corn meal and plaster of Paris? The only thing we can do under the circumstances is to husk the corn as soon as it can possibly be done, and get it in our metal cornerib made of perforated galvanized iron. I should like to ask some of the old farmers who read our journal what one is to do in such a predicament. Perhaps several good rat terriers taken down into the cornfield would help matters; but it looks to me just now as if it would take a lot of dogs to take care of the business. And what shall we do with the dogs after we get through harvesting our corn?

Several days after I put out the corn meal and plaster the rats seemed to have vacated. As blackbirds were troubling at the same time, sometimes in flocks of about a thousand, we sent a boy down with a shotgun. Well, the shotgun not only frightened away the birds, but it probably helped by frightening off the rats too. So shotguns and a boy may sometimes be a pretty good combination after all. But the gun should always be in the hands of a very careful boy. In speaking about dogs, it just now occurs to me that, if we had a gasoline dog, something as we have a gasoline horse (that is now so rapidly taking the place of the real horse), it would be an advantage. We would not be required to furnish said dog "board and lodging," when he is not needed.

Later.—Since the above was put in type the corn has been husked and put in the crib. From that part of the field that was planted first, the very day it was marked out, some of the shocks gave 2½ bushels each, but the other part of the field, planted later, was put back by bad weather, and did not come anywhere near the part just mentioned. After planting three times in the effort to get a good stand, as a last resort we filled vacancies with marrow beans, and have to-day, Oct. 29, four bushels of nice beans. You see the beans cost nothing except planting and harvesting, for we should have had to go through the motions of cultivating just the same whether there were any beans there or not.

THE BLUEBERRY UNDER CULTIVATION; CHILD'S WONDERBERRY, ETC.

We are rejoiced to notice that the Department of Agriculture has finally succeeded in growing larger and finer blueberries than any found growing wild. See the report below:

U. S. DEPARTMENT OF AGRICULTURE, }
DIVISION OF PUBLICATIONS, }
JOS. A. ARNOLD, Editor and Chief. }

EXPERIMENTS IN BLUEBERRY CULTURE.

An interesting and significant feature in the experiments reported in Bulletin 193, of the Bureau of Plant Industry, just issued by the U. S. Department of Agriculture, is the light shed on the possible util-

lization of naturally acid lands that occupy extensive areas in the Eastern United States, to produce the delicious blueberry or some other crop that thrives in acid soils.

The Department has found by experiment how blueberries differ from ordinary plants in their methods of nutrition and in their soil requirements, and by means of this knowledge it has worked out a system of pit culture under which these plants attain a development beyond all previous expectations. The failure heretofore of attempts to cultivate blueberries commercially as a market fruit appears to be due to a misunderstanding of the soil requirements of the plants, which, as these experiments show, are radically different from those of our common cultivated plants.

The market would gladly pay a higher price for cultivated blueberries of superior quality. A marked distinction should be made in market quotations between the large plump blueberry (genus *Vaccinium*), whose seeds are so small as to be almost unnoticed when they are being eaten, and the huckleberry (genus *Gaylussacia*) in which the seed is surrounded by a bony covering like a minute peach-pit, which crackles between the teeth. The failure to make this distinction in nomenclature, and the unsightly condition in which careless handling often presents the berries to the buyer, are the cause of much of the failure in southern markets to appreciate the blueberry at its real value. As the blueberry withstands the rough treatment incident to shipment so much better than most other berries, with proper handling it should always reach the market in first-class condition, whether shipped from North Carolina to Boston in early June, or Nova Scotia to Washington in late September, making the blueberry season cover a period of nearly four months.

To those desiring to experiment with field culture of the swamp blueberry, whether with wild plants, seedlings, or plants grown from cuttings, two methods of treatment are suggested, both deduced from the experiments already made. The first method, suited to upland soils, is to set the plants in trenches or separate holes in well-rotted peat at least a foot in depth, and mulch the surface well, either with leaves or with clean sand. The excavations should provide ample space for new growth of the roots, and the peat used may be either of the bog or the upland type, and should have been rotted for several months before using. The soil should afford good drainage, the ideal condition of the peat about the roots of the plant being one of continued moisture during the growing season, but with all the free water draining readily, so that thorough aeration of the mass of peat is assured.

The second method of field culture suggested is to set the plants in a peat-bog after the bog has been drained, turfed, and deeply mulked with sand, just as for cranberry culture, except that no special provision need be made for rapid flooding of the bog for winter, and the ground water of the bog might be kept a little lower than is usual with cranberries. Before beginning the work, these experiments should be carefully studied by any one proposing to undertake the culture of blueberries.

Washington, D. C., Oct. 18, 1910.

Our readers, especially the older ones, will remember the attempt made to grow blueberries in the garden years ago, and the general failure. With the above suggestions, however, I have no doubt we shall succeed. Now, in regard to Childs' wonderberry, or improved sunberry, as he calls it: Last spring when I came from Florida I spent 20 cents for a package of the improved sunberry, so extravagantly lauded during the past season. I received only an exceedingly small pinch of very small seed; and with the best care I could give them in the greenhouse I secured only six plants. Five of them are now pretty well loaded with berries. The berries are very small—not much larger than a good-sized elderberry. Not enough have ripened yet to make a pie or sauce. And, by the way, if I am correct they are advertised to ripen in sixty days.

Mine have had twice sixty days, and very few have ripened at this date, Oct. 21. The garden huckleberry* that I wrote about a year ago has berries more than four times as large, and which ripen very much quicker. These *do* make delicious pies, especially if mixed in with sour apples; and with my present experience I should much prefer them to the sunberry. When the latter gets dead ripe, however, they may prove more worthy of all that has been claimed for them. The garden huckleberry is much easier to gather on account of its larger size, and growing in great clusters. By the way, Childs lays much emphasis on his berries always growing true to name. Among my six plants there is one with different foliage and altogether a different habit. It is unlike the garden huckleberry or sunberry; and, by the way, the sunberry, although plainly a solanum, or nightshade, is quite a little different in foliage, as well as fruit, from the garden huckleberry; but this sport I have been speaking of is different from either; and, strange to tell, it is not annoyed at all by the flea beetle. Both of the other plants would have been eaten up in no time had I not kept the flea beetles off by hand picking, for the flea beetle seems to prefer this nightshade to any other plant grown. While at our experiment station a few days ago one of the directors told me the wonderberry would be sure to introduce flea beetles on our premises in great abundance, even if we had never had them before. When our plants were small I had to keep them covered with cheese-cloth or they would have been eaten up in one day.

Here is something further in regard to the wonderberry:

I am one who invested in John Lewis Childs' wonderberry last spring, 1909. I gave it the best place in my garden; gave it good care all summer; and instead of having a bush I had a few small plants. I then replanted some in pots, and at the present time have five watery-stem plants six inches high that show no signs of making good, to say nothing about the berries that were promised in a few weeks. The only "wonder" I see is that he dare advertise it again this year.

Auburn, N. Y., March 26.

C. G. HAYDEN.

SOWN IN FALL, COMES UP NEXT SPRING.

Last summer I got some sweet clover from the A. I. Root Co., and sowed it in August. We had a drouth soon after, which continued till fall. What came up could not grow much, as it was too dry, and all heaved out during the winter. When spring came the ground was bare. In April I had an accident, and could not work all summer nor oversee the work; so I ordered a man to plow the ground where the sweet clover had been sown. After he had it plowed he told me he would not have plowed that ground, as it was all full of clover, and would have made a pretty good crop. It seems to me I learned something by that. In your booklet on sweet clover we read that it grows one season, bears seed the second season, and, if not harvested, will reseed itself and grow next season. Now, I do not know just what time the seed ripens and falls to the ground; but it seems to me that, if we knew the time, we would know when to sow sweet clover. I had thought that, in my case, the seed germinated and perished in the drouth; but now I believe that but very little of it germinated last fall, but did so in the spring, and grew.

Doylestown, Pa., Aug. 8.

A. C. GROSS.

*The garden huckleberry is $\frac{3}{8}$ inch in diameter, the wonderberry about $\frac{1}{8}$, and hardly a quarter as much in weight.



